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ABSTRACT

Written as an aid for writers of Army narrative training literature, this guidebook emphasizes performance-oriented writing (preparation of literature intended to help someone learn and perform job related tasks). The eight chapters contain extensive examples and illustrations. An introductory chapter discusses why and how the guidebook was developed, what it does, and how to use it. Chapter 2 treats the difference between topic-oriented and performance-oriented writing and gives a number of examples of both. Chapter 3 deals with preparing to write performance-oriented training literature and includes sections on determining who the primary user of the materials is and how to select and organize content. Chapter 4 concentrates on estimating the primary user's reading level and estimating the reading gap between the writer and the reader. The chapter also includes a section on what makes writing difficult to read. Chapter 5 includes examples of materials that have been revised, with the "before" on the left hand page and the "after" on the right hand page for comparison. Chapter 6 discusses why, when, and how illustrations should be used and gives "before" and "after" examples. Chapter 7 discusses information retrieval aids for the user and gives examples. Chapter 8 provides a "sampler" of several effective methods of presenting information. The three appendixes include a readability formula and lists of reference materials for the technical writer. (LMS)

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Combat Training Techniques

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GUIDEBOOK
FOR THE DEVELOPMENT OF ARMY TRAINING LITERATURE

BEST COPY AVAILABLE

Richard P. Kern, Thomas G. Sticht, Diana Welty,
and Robert N. Hauke
Human Resources Research Organization

November 1975

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The guidebook is a complete job aid for the writer of performance oriented training literature, with step-by-step instruction for the development of operators and maintenance manuals and special training/performance texts at the appropriate reading level. Numerous examples of proper text preparation, best use of graphic illustration, selected reading levels, and practical motivation of the user of the training/performance literature are presented.

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FOREWORD

The guidebook has been written as a job aid for writers of Army narrative training literature, e.g., Field Manuals, Training Circulars and Special Texts. Since such literature focuses on helping someone to learn to perform job related tasks, the guidebook emphasizes performance-oriented, rather than topic-oriented, writing. It has also been designed to help the writer insure that he is writing at the appropriate reading level for his intended audience. The guidebook emphasizes understanding of principles of good writing through the extensive use of examples rather than lecturing about style, format and other design features.

ARI research in this area is conducted as an in-house research effort augmented by contracts with organizations selected as having unique capabilities and facilities in a specific area. The work reported here was conducted by the Human Resources Research Organization (HumRRO), Western Division, under Contract Nr. DAHC19-73-C-0051. The research was conducted under RDT&E Project 2Q063101A755, FY 1973 Work Program.

J. E. UHLANER
Technical Director

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INTRODUCTION

WHY WAS THIS GUIDEBOOK DEVELOPED?

1. Because most of the current Army training literature is:
    - too difficult for many Army readers (see Chapter 2).
    - oriented toward content area topics rather than job performance (see Chapter 2).
2. Because Army writers who were interviewed reported the need for the type of guidance presented in this Guidebook.

HOW WAS THE GUIDEBOOK DEVELOPED?

To develop the Guidebook, information was obtained from interviews with Army writers and editors located at five Army Service School Centers where training literature supporting high density Military Occupational Specialty (MOS) areas is produced.

Close to 100 interviews were analyzed to find out what kinds of information these writers would find useful in a Guidebook. Most of these writers reported that they get ideas for writing style and format by reviewing previous edition of the same or related manuals.

Thus, because these writers tended to model their products after existing products, this Guidebook offers numerous models of *good* examples of writing in a convenient package. Writers can find in this Guidebook models which they can imitate in their own writing.

In addition to interviews with Army writers and editors, an extensive review was conducted of books on technical writing, existing Army writers' guides, scientific literature, and graphic displays.

Dozens of Army manuals were studied to select the examples used as models throughout the Guidebook. Most of this material served as *Before* revision models, while the *After* revision models were specially written and designed for this Guidebook.

Notable exceptions to the use of specially written materials as *After* examples occur in the last section of Chapter 6. Here, new materials prepared by the Combat Arms Training Board are presented as *After* examples.

WHAT PRINCIPLES GUIDED THE GUIDEBOOK DESIGN?

This guidebook was designed to serve as a job aid for the writer as opposed to a "study text." The attempt has been to minimize the amount of study effort required of the user of the Guidebook:

- We have avoided lengthy "how to do its", grammer lessons, exhortations about "dos" and "don'ts."
- We have emphasized intuitive understanding by extensive use of models rather than lecturing about style, format and other design features.
- We have catalogued information in the Guidebook, rather than develop lessons to be studied so that information could be catalogued in the user's head.
- We have followed the ideas for readable writing and formatting presented in the Guidebook.

WHAT TYPE OF TRAINING LITERATURE DOES THE GUIDEBOOK ADDRESS?

The Guidebook focuses on preparation of literature intended to help someone *learn* job related tasks and *perform* job related tasks. This would include any manual the individual is expected to use for "how to do it" guidance outside of the formal instructional setting.

The Guidebook does not address the specific problems involved in producing texts intended for use in academic instruction (for example, programmed instruction), or those involved in producing texts intended for use as general, encyclopedic references. However, the principles illustrated in the examples of "good" and "bad" writing should be helpful to writers of any type of training literature.

Chapter 1

INTRODUCTION

WHY WAS THIS GUIDEBOOK DEVELOPED? . . . . Page 2

HOW WAS THE GUIDEBOOK DEVELOPED? . . . . Page 2

WHAT PRINCIPLES GUIDED THE GUIDEBOOK DESIGN? . . . . Page 2

WHAT TYPE OF TRAINING LITERATURE DOES THE GUIDEBOOK ADDRESS? . . Page 2

WHAT DOES THE GUIDEBOOK DO? . . . . Page 3

HOW SHOULD THIS GUIDEBOOK BE USED? . . . . Page 3

AT DOES THE GUIDEBOOK DO?

- **Presents numerous examples of improved writing and manual formatting which writers can use as models for producing their own manuals (Chapter 5).**
- **Presents information about the reading ability levels of Army enlisted personnel, so that writing difficulty level might be better matched to reading levels of personnel (Chapter 4).**
- **Presents step-by-step procedures for using the simple FORCAST readability formula for checking the reading difficulty level of what has been written (Appendix A).**
- **Compares and contrasts topic oriented and performance oriented literature and provides models of performance oriented literature (Chapter 2).**
- **Provides guidelines for identifying primary users of a to-be-written or revised manual, and for orienting literature to these readers (Chapters 3, 4).**
- **Provides guidance on the use of illustrations (Chapter 6) and on methods of preparing tables of content and indexes to make it easier for users to locate information in a manual (Chapter 7).**
- **Provides references to several different projects which have developed different ways for presenting printed information, and provides examples of materials from each project so that writers can decide if they want to order complete reports to learn how to prepare these different types of materials (Chapter 8).**
- **Provides a list of references to Army publications concerned with the development of training literature (Appendix B).**

HOW SHOULD THIS GUIDEBOOK BE USED?

1. Army Training Literature management should make sure that copies of the Guidebook are in plentiful supply and available to all writers and editors.
2. You (anyone tasked to produce a training manual) should first study Chapters 2, 3, and 4 to:
    - note the differences between topic oriented and performance oriented writing (Chapter 2)
    - look over the decision rules for identifying your Primary User and his information needs; use these decision rules to guide you in developing the identification of the Primary User and in organizing content to put it in a form compatible with the users' needs (Chapter 3)
    - estimate the reading skills of your Primary User; use the reading tests to get a "feel" for the level of reading skill you can expect your reader to have compared to your own (Chapter 4).
3. Next you should browse through Chapter 5, looking first at the Index of Literature Types and Rewrite Problems, and then at the *Before* and *After* examples. Look for style and format designs you like. Try to note what revision procedures were used in producing the *After* models.
4. Look through Chapter 6. Notice the three different, major objectives (the "Why") you might have in mind when using illustrations. Look over the "how" and "when" given under each. Refer back to these when you are reviewing portions of your draft to identify where illustrations could be helpful.
5. Browse through Chapters 7 and 8 for additional ideas about ways to present the information you are to write.
6. Consult the numerous examples in the Guidebook during your writing to find writing and formatting ideas.
7. Apply the FORCAST formula (Appendix A) to what you have written from time-to-time to make sure your writing style is not too difficult for your intended readers.

Chapter 2

TOPIC-ORIENTED VERSUS PERFORMANCE-ORIENTED TRAINING LITERATURE

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TOPIC-ORIENTED TRAINING LITERATURE VERSUS PERFORMANCE-ORIENTED TRAINING LITERATURE

THE PROBLEM

Most Army Field Manuals and Training Circulars are Topic-oriented texts.

Topic-oriented writing places heavy demands on the reading, studying, and conceptualizing skills of the user.

WHAT IS TOPIC-ORIENTED WRITING?

• Topic-oriented writing focuses on the generalizations and concepts which constitute a body of knowledge—it tells "about" a subject area rather than telling "what to do" or "how to do it".

•• Topic-oriented manuals do not identify a particular user audience. A topic-oriented manual is frequently described as a general reference text, intended for anyone from Private to General.

••• Topic-oriented writing does not identify subject-related duties and tasks, who might be expected to perform them, or how any given user might perform them. The description of the "body of knowledge" may carry implications for duty and task performance for everyone from the Private to the Unit Commander. However, it's left up to the reader to deduce from this description what duties and tasks should be performed, how they should be performed, and who should perform them.

THE SOLUTION

Army training manuals, written to assist a person in learning or performing duties and tasks, should be Performance-oriented texts.

Performance-oriented writing minimizes demands on the reading, studying, and conceptualizing skills of the user.

WHAT IS PERFORMANCE-ORIENTED WRITING?

• Performance-oriented writing focuses on the duties and tasks a user is expected to perform and the information he needs in order to perform these duties and tasks—it tells the user, "what to do" and where possible, "how to do it".

•• Performance-oriented manuals identify a particular user audience. To write performance-oriented literature you start by identifying who you expect the major user to be and the subject-related duties and tasks this user will perform. You then translate your knowledge of the subject area into the information and directions this user will need to learn and perform the duties and tasks you have identified.

••• In performance-oriented writing, information is selected from the "body of knowledge" and organized to place major emphasis upon its application to duty and task performance. It "talks" directly to the user, the duties and tasks he is expected to perform, and how he can perform them. As a result, performance-oriented literature has greater relevance to a job training or job performance setting than topic-oriented literature. The reader does not have to strain the information he needs out of the general pot of knowledge and then wrestle with the "so what should I do about it" question.

TOPIC-ORIENTED WRITING VERSUS PERFORMANCE-ORIENTED WRITING

Note in the example below how "local alarm" is treated as a topic or "body of knowledge" rather than as a description of how to set-up and implement a contingency plan. Activities to be carried out by the unit commander and the individual members of the unit are all interwoven or scrambled together without clear indication of who is expected to do what.

EXAMPLE 1-A: TOPIC-ORIENTED WRITING

CBR: THE LOCAL ALARM

The local alarm (warning) is given by any person recognizing or suspecting the presence of a CBR hazard. Unit SOP's must provide for the rapid transmission of the warning to all elements of the unit and to adjacent units. Brevity codes should be used where feasible. Suspicion of the presence of a chemical hazard is reported to the unit commander for confirmation. It is important to avoid false alarms and to prevent unnecessary transmission of alarms to unaffected areas. Consistent with the mission and circumstances of the unit, the alarm will be given by use of any device that produces an audible sound that cannot be easily confused with other sounds encountered in combat. Examples of suitable devices for local alarms are empty shell cases, bells, metal triangles, vehicle horns, and iron pipes or rails. The unit SOP should specify the devices to be used, locations of the devices in the unit area, and procedures to be followed. As a supplement to the audible (sound) alarms or to replace them when the tactical situation does not permit their use, certain visual signals are used to give emergency warning of a CBR hazard or attack. These visual signals consist of donning the protective mask and protective equipment, followed by an agitated action to call attention to this fact. In the event of a chemical agent attack, there is a danger of breathing in the agent if the vocal warning is given before masking. The individual suspecting or recognizing this attack will mask first and then give the alarm. The vocal alarm for chemical agent attack will be "SPRAY" for a spray attack, and "GAS" for an attack delivered by other means. The vocal warning is intended for those individuals in the immediate vicinity of the person recognizing the attack. The vocal alarm does not take the place of the sound alarm or the visual signal to alert a unit of a chemical attack.

Taking only what was given in the original paragraph (Example 1-A) we have recast it into performance-oriented writing. What we did was to organize the information as a unit commander would have if he were to use it to guide the development or check the completeness of his unit SOP.

EXAMPLE 1-B: PERFORMANCE-ORIENTED WRITING

CBR: THE LOCAL ALARM

The local alarm or warning is given by any person who knows, or thinks, that a CBR hazard is present.

Unit Commanders' Responsibility for the Local Alarm Procedure

The Unit Commander will prepare a Unit SOP describing the procedures to be followed in giving the local alarm. These procedures must provide for:

a. A vocal alarm to warn people who are near to the person who gives the alarm;

b. A sound alarm to warn people in the Unit's area—

(1) This alarm should produce a sound that will not be confused with other sounds of combat. Examples of objects that might be used are empty shell cases, bells, metal triangles, vehicle horns, and iron pipes or rails.

(2) The Unit SOP should identify the object to be used, where it is located, and how it is to be used to give the alarm;

c. A visual signal to be used in addition to the sound alarm, or, in place of the sound alarm when silence is necessary;

d. A way for members of the Unit to quickly report a suspected CBR hazard to the Commander for confirmation;

e. Rapid communication of the warning to other nearby units, making use of brevity codes if at all possible.

How to Give the Local Alarm

In case of Chemical attack, use these steps to give the local alarm:

a. Put your mask on first;

b. Give a vocal alarm—

If spray attack, say "SPRAY",
For all other kinds, say "GAS";

c. Give the sound alarm, visual signal, or both, as directed in your Unit SOP;

d. Pass the warning to the Unit Commander as directed in your Unit SOP.

TOPIC-ORIENTED WRITING VERSUS PERFORMANCE-ORIENTED WRITING

Note that while both the gunner and the tank commander are referred to, these paragraphs do not directly address what either user is expected to do. The major focus in these paragraphs is the definition of the concepts.

EXAMPLE 2-A: TOPIC-ORIENTED WRITING

Section II. SENSINGS

13–11. General

Sensing is noting mentally where the round appears in relation to the target. The round and target must be seen at the same time; otherwise, only the round or effects of the round are observed. Every round fired is sensed, when possible, for deflection and range, by both the tank commander and the gunner. Tracer equipped rounds are sensed at the point where the tracer strikes short of, passes, or hits the target; nontracer rounds are sensed at the point of burst. The strike or burst must be sensed immediately to avoid errors caused by drifting smoke or dust. When attempting to sense tracers, crewmen must concentrate on the target rather than the path of flight of the tracer. The gunner must be cautioned that he can adjust fire only when he actually senses the round in relation to the target. The gunner may be able to see the tracer or burst through the haze of the obscuration but will not be able to see the target or he may only be able to see the tracer after it passes the target or burst beyond the target. In such cases he only has an observation and not a sensing. Also, a residual cloud of dust produced by a projectile striking the ground may indicate the general location of the strike and provide an observation.

13–12. Deflection Sensings

Deflection sensings are mental notations of whether the round is on line with or to the side of the target. There are three deflection sensings: *right*, *left*, or *line*. The gunner notes the point on his sight reticle and the tank commander measures the amount of error, using the horizontal mil scale of the binocular reticle or estimates the mil error. Deflection sensings are not announced but form the basis of deflection corrections in adjusting fire. With tank ammunition there will be little or no error in deflection if boresighting and zeroing are performed properly.

13–13. Range Sensings and Observations

There are five range sensings: *target*, *over*, *short*, *doubtful*, and *lost*. Although these sensings are mental, they will be announced at times. There are two observations—*over*, and *short*—which are made by the gunner or tank commander when he observes some evidence of the round being over or short, but cannot accurately sense the round. In adjustment if the gunner senses the round or burst, he will remain silent and apply the primary method of adjustment burst-on-target. If the gunner does not sense or observe either the tracer or burst after firing, he announces LOST. However, if he observes evidence of the round being over or short he announces OVER or SHORT, allowing the tank commander to adjust fire. The tank commander announces his range sensings or observations when the gunner makes an announcement or anytime the tank commander takes over the adjustment of fire, using the alternate method of adjustment. The five range sensings are discussed in the following subparagraphs.

a. Target. A round is sensed as target (fig 13-3) when the round or shell fragments strike any part of the target even though subsequent adjustments may be necessary toward the center of vulnerability to destroy the target. A hit may cause the target to change shape, move, disappear, or burn. When a round strikes a metal target, a distinct bright flash is seen.

b. Over. A round is sensed as over (fig 13-4) when the tracer passes above the target. The tracer is sensed at the point where it passes over the target. Over sensings are also sensed for deflection; for example, *over, three right.*

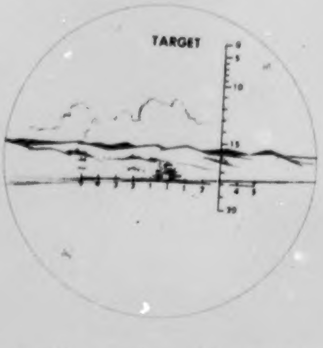
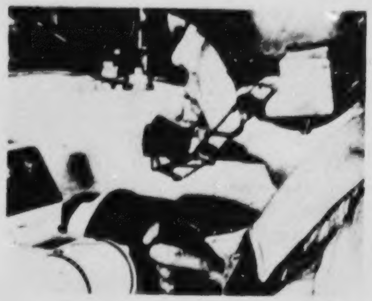


Figure 13-3. Sensings of target (as seen by tank commander).

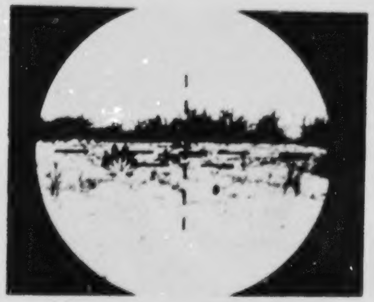
The material below was prepared specifically for the trainee Gunner. Note that instead of first defining and discussing such concepts as "sensing," "short," "doubtful" this writer started directly with what the gunner will see, what he does, and how he does it.

EXAMPLE 2-B: PERFORMANCE-ORIENTED WRITING

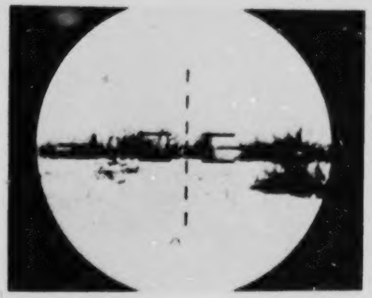
7 When the gunner fires, he tries to "sense" the round—watches where the round goes in relation to the target.



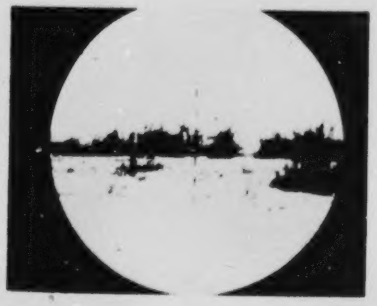
8 If the round strikes short of the target, the gunner says to himself, "SHORT." He sees where the burst appears on his reticle and uses burst-on-target.



9 To use burst-on target for a SHORT round, the gunner notes the point on his reticle where the burst was seen; he moves this point onto the center of the target and prepares to fire the next round. In the picture, the gunner has used his elevation and traverse controls to move his reticle up and to the right so that his next round will be on target.



10 The gunner fires; he should see this burst at the same place on the reticle where he saw the first one. This time, then, the burst should be on target.

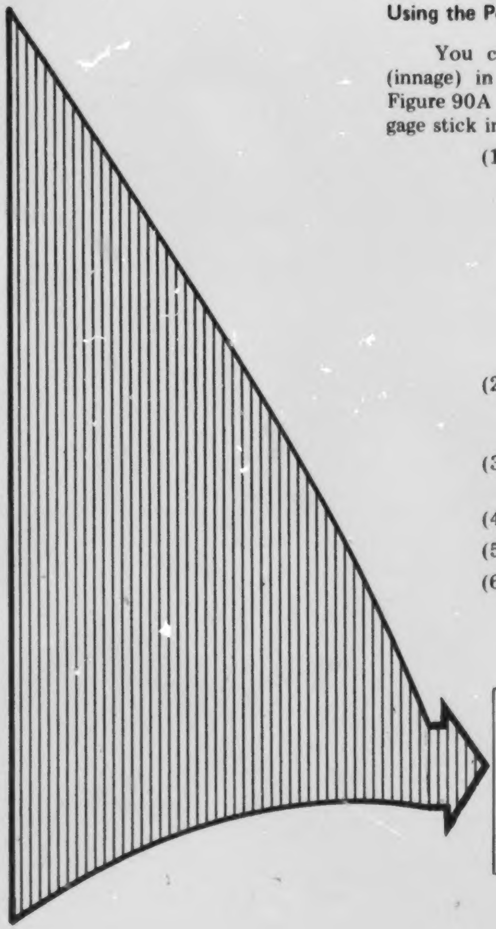


TOPIC-ORIENTED WRITING VERSUS PERFORMANCE-ORIENTED WRITING

This passage attempts to explain how spontaneous combustion occurs. Note how general this information is and how it is presented completely separate from any duty or task performance context.

EXAMPLE 3-A: TOPIC-ORIENTED WRITING

f. Spontaneous Heating. Heating of a combustible material, or combination of materials, is described as spontaneous if inherent characteristics of the materials cause a heat-producing chemical action without exposure to external sources of heat. The process is spontaneous combustion if ignition occurs. The causes of spontaneous heating are few, but the conditions under which they operate are many and varied. More than one factor may be operative in some cases, and one may be conducive to another. Technical information as to the exact details is limited. Laboratory tests are often inconclusive because of the difficulty of duplicating operating conditions. It is unsafe to conclude that a material will not heat spontaneously because it has not done so under a given set of circumstances. The process usually starts with a slow chemical reaction, or slow oxidation, which generates some heat. The process accelerates as heat builds up until rapid oxidation takes place. Ignition may occur after days or weeks, during which the temperature has been slowly increasing. The process can and does proceed in various materials without dangerous effects if the heat generated can be dissipated. If dissipated as fast as generated, ignition cannot occur. Ventilation is therefore an important factor. On the other hand, complete lack of ventilation is a positive deterrent. Complete absence of ventilation would not prevent spontaneous heating and ignition if a chemical source of oxygen were present. The most common instance of spontaneous heating is that which takes place in oil- or paint-soaked waste or rags, particularly those soaked with linseed oil and paint driers. Oily waste and rags should not be left in lockers or supply cupboards; they should be collected in airtight metal containers for safekeeping until disposed of.



This example shows how the writer of the topic-oriented passage on Spontaneous Heating might have handled this material if he had been writing a performance-oriented manual for the petroleum handler.

EXAMPLE 3-B: PERFORMANCE-ORIENTED WRITING

Using the Petroleum Gage Stick to Find Innage

You can use the petroleum gage stick to find the height of a product (innage) in small horizontal tanks, nonpressure tank cars, and tank vehicles. Figure 90A shows the correct position of the gage stick in the tank. Use the gage stick in this way:

(1) Lower the stick into the tank vertically.

NOTE:

(a) Lower the stick with care so that it does not make a splash. A splash can cause a cut on the stick which will give you the wrong reading.

(b) Make sure that the stick rests on the bottom and not on a rivet head or other projection inside the tank.

(2) When you gage a small horizontal tank which has a reference point, note whether the reading on the gage stick at the reference point is the same at the reference height of the tank.

(3) Take out the stick and read the product cut on the stick. Record this figure as the innage gage.

(4) Clean the stick at the cut by wiping with a cloth.

(5) Lower the stick again and take a second reading.

(6) Clean the stick with the cloth.

CAUTION

Do not leave oily rags lying around or in lockers or supply cupboards. They may start heating and when they become hot enough they burst into flames. Put oily rags in airtight metal containers until you can get rid of them.

Chapter 3

PREPARING TO WRITE PERFORMANCE-ORIENTED TRAINING LITERATURE

PREPARING PERFORMANCE-ORIENTED TRAINING LITERATURE

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GUIDELINES FOR PREPARING PERFORMANCE-ORIENTED TRAINING LITERATURE

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PREPARING PERFORMANCE-ORIENTED TRAINING LITERATURE

You've been assigned the job of writing a Field Manual or Training Circular. Based on our interviews with Army writers, your writing assignment probably identifies a subject area (e.g., defense against CBR attack; or, vehicle recovery operations), but does not identify an audience you are expected to focus on in preparing the manual. You, as a subject matter expert, or as a writer working with subject matter experts, are generally expected to develop the identification of audience, purpose, and scope for the manual.

PURPOSE OF PERFORMANCE-ORIENTED TRAINING MANUALS

A performance-oriented text is expected to assist a person in learning or performing duties and tasks related to the writer's topic or subject area. It is important, therefore, that the content of the manual be selected and organized so that a given user can clearly identify what you expect him to do and how he might be expected to do it.

WHAT DUTIES AND TASKS DO YOU EXPECT TO COVER? WHO PERFORMS THEM?

In planning a performance-oriented text you first focus on identifying potential users and the duties and tasks they perform which are related to your assigned subject area. By examining this information, you then identify a *Primary User* and the duties and tasks he is expected to perform. Once this is accomplished, you are ready to focus on developing the application of your area of knowledge to the performance expected of the Primary User.

WHAT DO WE MEAN BY THE TERM, "PRIMARY USER"?

Primary User indicates a group of people who are expected to perform:

- essentially the same duties and tasks related to an assigned subject area;
- under essentially the same environmental conditions or range of conditions;
- using the same equipment or other special resources.

The Primary User provides a central focus for your development of the manual. In other words, the manual will be developed to meet the information needs and reading level characteristics of this Primary User. Sometimes you may end up identifying more than one Primary User. In this case you will need to decide how you can best "package" the information so that it will be accessible and useful to each Primary User.

HOW TO USE THE GUIDELINES

The guideline steps offered in this Chapter are intended as general guidance. How you can best use them will depend on the amount of knowledge you already have about your subject area and about how it is put into practice by people out in the actual job settings.

IF - you are not well acquainted with the various users, what they are expected to do, and the conditions under which they are expected to perform —	THEN - use the steps outlined to DEVELOP your identification of the Primary User(s).
IF - you are already well acquainted with the various users, what they are expected to do, and the conditions under which they are expected to perform —	THEN - use the steps outlined to REVIEW the focus and clarity of your identification of the Primary User(s).
IF - you have identified more than one Primary User —	THEN - use the information called for in the steps to help you decide how you can best "package" the information for each so that it will be accessible and useful to each.
IF - you want to know more about the approach to organizing and drafting Performance Oriented material —	THEN - study the information given in the steps for organizing and preparing the draft.

AN OVERVIEW OF THE GUIDELINES

PART I - IDENTIFYING THE PRIMARY USER GROUP AND THE CONTENT REQUIREMENTS FOR YOUR WRITING ASSIGNMENT

Given a writing assignment:

STEP 1 - Identify the job incumbents whose duties and tasks should be directly affected by the subject matter of your assignment.

(Identify the potential users first by Job Role Category; then, within each Job Role category by MOS—Job Position title and Type of Unit or similar group of Units to which assigned.)

STEP 2 - Describe the major duties and tasks (related to your assignment) that each of these potential users is expected to perform.

STEP 3 - Determine which of these potential users can be expected to perform essentially the same duties and tasks, using the same equipment or resources. Sort these potential users, sharing the same information needs, into potential Primary User groups.

STEP 4 - Identify the Primary User group (or groups) you will address in your writing assignment.

STEP 5 - If you identify more than one primary User group for your writing assignment:

Establish a plan describing how the information is to be "packaged" for each of the Primary User groups so that it will be accessible and useful to each.

NOTE: You have now identified the Primary User (or Users);

You have identified the content requirements by your outline description of WHAT the Primary User is expected to do; and,

In accomplishing the preceding, you have identified and recorded literature references and other information sources you will want to consult again for additional detail.

You are now ready to organize the information you will present to the Primary User and to then start writing the draft.

PART II - ORGANIZING AND PREPARING THE DRAFT

STEP 6 - Develop a coherent outline description of WHAT the Primary User (or each Primary User, if more than one) is expected to do in the operational setting. Do this by organizing and developing the subject-related duty and task statements for this Primary User.

STEP 7 - Using the developed outline description of WHAT the Primary User is expected to do as a draft outline, apply your technical subject area knowledge and write the HOW-to-do-it to accompany each WHAT.

STEP 8 - Review the draft for usability (organization) and readability (coherence, directness and reading difficulty level) from the perspective of your Primary User's information needs and his operational setting.

GUIDELINES: PART I - IDENTIFYING THE PRIMARY USER AND THE CONTENT REQUIREMENTS FOR YOUR WRITING ASSIGNMENT

WHAT YOU SHOULD DO AND WHY

STEP 1 - Identify the potential users of the information you have been asked to prepare.

REASON - A number of different job incumbents may have varying degrees of need for information in your assigned area. You need to take inventory of who these potential users are and the nature of their information needs in order to arrive at the final decision of who your Primary User should be.

Substep 1-A - Identify the Job Role category or categories to which your potential users belong.

REASON - Users occupying different Job Roles will perform different duties and tasks related to your subject and hence have different information needs. Thus, if you identify potential users in more than one of the four Job Role categories, you will know at the outset that you are thinking in terms of more than one Primary User group. Keep these Job Role groups separate while developing the duty and task information for potential users within each group.

GUIDANCE FOR PERFORMING THE STEP

Ask yourself and the other content experts working with you: Whose job duties and tasks should be directly affected by this new or revised information?

Using the table at the right, review your own and other experts' knowledge of the Job Role category or categories which include users you think should be considered as candidates for Primary User(s).

Record the Job Role category title you have identified on the top line of an index card. Use separate cards for each title if you have identified potential users from more than one Job Role category.

Cards containing the more detailed information on potential users within each Job Role category will be filed behind the appropriate Job Role category card.

USE THESE AIDS TO ACCOMPLISH THE STEP

WHAT IS THE JOB ROLE OF THE POTENTIAL PRIMARY USERS OF YOUR MANUAL?

Job Role Title	Job Role	Information Needs
(A) Unit Commander (and Headquarters staff).	Directs, manages & plans for accomplishment of Unit mission.	Information as it applies to duties & tasks involved in Unit direction, management & planning.
(B) Direct Supervisors of those performing work activities related to your subject area (e.g., NCO Section Ldr., Platoon or Squad Ldr.)	Assigns, directs & checks subordinates' work activities.	Information as it applies to duties & tasks involved in assigning, directing & checking subordinates' work activities.
(C) Worker (neither instructor nor supervisor).	Performs assigned tasks as directed.	Information as it applies to performing assigned tasks.
(D) Instructor	Training others to perform your subject-related job activities.	The duties & tasks he is to train others to perform; job aids for organizing & conducting training; training objectives & performance standards.

WHAT YOU SHOULD DO AND WHY

Substep 1-B - Identify potential users within Job Role categories by MOS-Job Position title.

Substep 1-C - Identify the Type of Units to which each MOS-Job Position title will be assigned.

REASON - You can generally expect a given MOS-Job Position title to be assigned to a variety of Type of Units (TOE#). Depending on the nature of your writing assignment, the potential user's subject-related duties, tasks, equipment and resources may differ significantly from some Types of Units to others. Therefore, for each potential user (MOS-Job Position title) you need to identify and sort into groups those Types of Units in which this user will perform essentially the same duties and tasks, using the same equipment or resources. The Type of Units making up such a group are what we mean in Substep 1-D by the term "comparable" Type of Unit assignments.

GUIDANCE FOR PERFORMING THE STEP

For each Job Role category you have identified, review your own and other experts' knowledge of WHO (MOS-Job Position title) you think should be potential users.

Record the MOS-Job Position title on the top line of a separate card for each potential user you have identified in this Job Role category. File these cards behind the appropriate Job Role category card. You will record the information called for in Substep 1-D on these same cards.

For each of these potential users, compile a list of the Type of Units (TOE or TDA reference) to which this potential user may be assigned. Review this list for each potential user separately, asking these questions:

- What are the duties and tasks related to your assignment that you would expect this potential user to perform if assigned to each of these Type of Units?
- What equipment or resources would he have to perform the tasks you are concerned with in each of these Type of Units?

USE THESE AIDS TO ACCOMPLISH THE STEP

To Find Literature:

by -	MOS, Job Position Title, & TOE units to which assigned.	(See para. II & III, of Appendix B - The Army Writer's Reference Shelf - for reference assistance.)
by -	equipment or other special resources each uses in carrying out subject-related duties and tasks.	(See para. III, of Appendix B - The Army Writer's Reference Shelf - for reference assistance.)
by -	subject-related duties and tasks each is expected to perform.	(See references in para. IV, Appendix B, as aids in identifying major duties and tasks.); (Also see references in para. VIII, Appendix I, to learn about the type of information your Task Analysis branch may be able to provide.)

NOTE: You will be developing and recording duties and tasks performed by potential users in greater detail in Step 2. You will find it will save time and effort to actually start recording the information called for in Step 2 as you are developing answers to the questions in this Substep (1-C).

WHAT YOU SHOULD DO AND WHY

Substep 1-D - Classify the Type of Units for each MOS-Job Position title into groups so that the Units in each group represent "comparable" Type of Unit assignments for that MOS-Job Position title.

REASON - In accomplishing this, you are saying that this potential user (MOS-Job Position title) will have the same information needs in relation to your assignment, as long as he is assigned to any one of the Type of Units within this "comparable" group of Units.

It is possible that there may be several different "comparable" groups of Units to which a given MOS-Job Position title could be assigned. Even though he carries the same MOS-Job Position title in each case, you need to keep his identification with each of these different groups separate because he has different information needs depending on which group his assignment falls within.

You will need this information later when you are deciding who the Primary User should be; whether you should be addressing more than one Primary User, and, if so, how you should package the information so it will be accessible and useful to each.

GUIDANCE FOR PERFORMING THE STEP

Based on your answers to the above questions, decide which Type of Units can be grouped to represent "comparable" Type of Unit assignments for a given user. You may have more than one such group for a given MOS-Job Position title.

Use the MOS-Job Position title cards prepared in Substep 1-B and record the Type of Unit or "comparable" group of Unit each MOS-Job Position title is assigned to. If a given MOS-Job Position title can be assigned to more than one type or group of "comparable" Units, list each group on a separate card labeled with the same MOS-Job Position title.

Repeat this information gathering, review, and recording procedure for each potential user you have identified in this Job Role category. File these cards behind the appropriate Job Role category card.

USE THESE AIDS TO ACCOMPLISH THE STEP

"Comparable" Type of Unit assignments are defined as those Units in which a given MOS-Job Position title can be expected to perform essentially the same subject-related duties and tasks, using the same equipment or resources.

When you finish Substep 1-D, you will have a card file (for each Job Role category) consisting of two sections:

Section 1, Job Role Identification
    1 card - Job Role category title

Section 2, MOS-Job Position title
    1 or more cards for each MOS-Job Position title with each card containing one Type of Unit or a listing of members of one group of "comparable" Units this MOS-Job Position title can be assigned to; equipment or special resources this MOS-Job Position title would use in performing your subject-related duties and tasks when assigned to this Type of Unit and the related literature or information source references.

STEP 2 - Identify the major duties and tasks related to your subject area that you expect each potential user to perform as well as the equipment or special resources he will use in performing them.

REASON: The objectives of this substep are to identify WHAT each different potential user in a given Job Role category is expected to do in relation to your subject area. You will use this information in three ways:

First, in deciding how many potential Primary User groups you have; Secondly, in deciding which group to address as the Primary User group (if more than one Primary User group is identified, you will use the description of these groups to decide how the information for each should be packaged so it will be accessible and usable to its intended audience); and, Thirdly, after identifying the Primary User group for your writing assignment, you will need the description of WHAT this user group is expected to do in order to apply your subject matter expertise to the task of telling them HOW to do it.

Start with a particular potential user (MOS-Job Position title; Type of Unit or group of "comparable" Units to which assigned) you have identified in Substep 1-D:

What are the major duties you would expect this potential user to perform in relation to your writing assignment?

Record the user's identification at the top of a blank card and enter under it a statement describing a major duty you expect him to perform in the operational setting. Also, record, on this card, literature references and other information sources that you either have reviewed or will want to review in developing the description of the tasks he will perform in accomplishing this duty.

Make out a new blank card and repeat this procedure for each different major duty you expect this potential user to perform. File these cards behind the card identifying this potential user and Type of Unit (Substep 1-D cards).

Still considering the same potential user:

- What are the major tasks this user will perform in accomplishing each major duty?

Next (or concurrently with development of the major duty statements if you prefer), start listing the major tasks (major steps or actions he will take) in accomplishing each major duty. Record each of these on a separate card keyed to identify the user (MOS-Job Position title; Type of Unit) and the major duty to which the task belongs. If he will be using equipment or special resources while accomplishing this task, identify this equipment or resource in a standard place near the bottom of the card. In addition, record literature and other information sources you have used in identifying this task.

Repeat this procedure until you have compiled, on the separate cards, an outline sketch of the major subject-related duties and tasks performed by each of your potential users. File the duty and task cards for each potential user behind the user's identification and Type of Unit card in the appropriate Job Role category section of your card file.

NOTE: In developing these detailed descriptions, you will gather information from experts knowledgeable about the given user and his operational setting; from individuals involved in related doctrine development; and from current doctrine and training literature. If possible, observe and talk to users in the operational setting.

From whatever sources you collect the information, analyzing and synthesizing it to form coherent descriptions of the duties and tasks performed by the potential user is a major task you have to accomplish. Systematic recording of the duty and task information you gather, along with the reference sources, will, however, make this job easier.

When you finish Step 2, you will have a card file (for each Job Role category) consisting of three separate sections:

Section 1, Job Role Identification
  1 card - Job Role category title

Section 2, MOS-Job Position title
  1 or more cards for each MOS-Job Position title with each card containing one Type of Unit or a listing of one group of "comparable" Units this MOS-Job Position title can be assigned to.

Section 3, Duties and tasks performed by each MOS-Job Position title - Type of Unit
  1 or more cards (for each MOS-Job Position Title in a given Type of Unit or group of "comparable" units) containing a major duty, a task belonging to this duty area, equipment used in performing the task, and literature or information source references.

STEP 3 - Identify and group together potential users who can be expected to perform essentially the same subject-related duties and tasks, using the same equipment or resources.

REASON - The objective of this step is to complete the grouping of potential users (within each Job Role category) into groups having the same subject-related information needs. These groups will then represent your potential Primary User groups.

Do you have potential users identified by different MOS-Job Position titles who are expected to perform essentially the same subject-related duties and tasks, using the same equipment or resources?

If so, make out a new index card to identify all of these MOS-Job Position titles and Type of Unit assignments on a single card. Replace their separate cards with this card.

Since this group of potential users perform the same subject-related duties and tasks, code one set of duty and task cards to identify this group of users. File this set behind the single card used to identify this user group.

Repeat this review and, when possible, grouping process, until you have examined all potential users you identified in Substep 1-B.

EP 4 - Identify the Primary User group (or groups) you will address in your writing assignment.

REASON - In carrying out the preceding steps, you have identified the various groups of users whose duties and tasks should be directly affected by your writing assignment. You have identified them so that each group consists of users whom you expect to perform essentially the same subject-related duties and tasks using the same equipment or resources. Therefore, you have reason to think that the members of each group will have essentially the same information needs in the area of your writing assignment.

You probably have identified more than one potential Primary User group. Your task now is to decide:

(a) which group (or groups) should your writing assignment focus on as the Primary User group (or groups)? And,

(b) if the decision is to prepare material for more than one Primary User group, how should the information for each Primary User group be "packaged" so that it will be accessible and useful to each group?

Separate the potential Primary User groups (within each Job Role category) into two classes:

(a) those that are considered "specialists" within your assigned subject matter area; and,

(b) those that would be considered "nonspecialists" in this subject area.

Review the subject-related duty and task descriptions you have generated for each potential Primary User group. Identify the duties and tasks for each group that will be affected by the new information (or revisions to existing information).

Estimate the extent to which your new information or revisions will affect the subject-related duties and tasks of:

(a) the Primary User groups you have identified in the "specialist" category;

(b) the Primary User groups you have identified as "nonspecialists" in relation to your subject area.

NOTE:

Specialist personnel are those who, by virtue of training or experience, are expected to have special knowledge of your subject area; perform duties and tasks requiring this special knowledge; and, usually are provided with specially designed equipment or resources to support their performance.

Nonspecialists are personnel who have no more than basic, "general subjects" type of training in your subject area; whose performance of subject-related duties and tasks would be of a field expedient or emergency nature and would not normally be supported by the special equipment or resources.

Example: In the subject area of field emergency medical treatment, the Combat Aidman would be considered a "specialist"; the infantry squad member a "nonspecialist."

Generally, your agency will have responsibility for both the preparation of literature in your subject matter area and for the MOSs that receive speciality training in these subject areas. Thus, for writing full manuals your Primary User group (or groups) will generally be personnel considered "specialists" in your subject area.

In addition, however, you will probably have identified several "nonspecialist" groups who are expected to perform limited duties and tasks based on your subject area. Your agency will generally also have responsibility for this portion of their literature even though it may be "packaged" as a part of a manual produced by another agency. In this case, you may be preparing material for your "nonspecialist" Primary User groups. This material will then be used by the other agencies which have primary responsibility for MOSs within your "nonspecialist" user groups.

EP 5 - Establish a plan describing how the information is to be "packaged" for each of the Primary User groups so that it will be accessible and useful to each.

REASON - You have identified several Primary User groups as having subject-related duties and tasks affected by the new or revised information in your assignment. However, this does not automatically mean that you should be preparing new manuals for each Primary User group you have identified.

You may have found, in carrying out Step 4, that the new information affects certain of your Primary User groups in such a minor fashion that there is no need to revise their existing literature or prepare new literature. Thus, you would drop these groups from further consideration as Primary Users for this assignment.

In still other cases, the effect on the duties and tasks of a particular Primary User group may not be extensive but still sufficiently important to warrant writing a "change" to existing literature.

Any one of three considerations may guide the decision to package your information as a new manual for a particular Primary User group:

(a) there is no existing literature on the subject-related duties and tasks expected of this Primary User;

(b) your writing assignment will present extensive changes in the duties and tasks expected of this Primary User;

(c) existing literature is appraised as being too difficult and too indirect to meet the needs of this Primary User.

Based on the extent of each Primary User group's information needs (and training literature management considerations), decide which form of "packaging" would be most accessible and useful to each of the Primary User groups:

(a) a new "manual" focusing on the full range of subject-related duties and tasks of a particular Primary User group;

(b) a new "manual" with separate sections devoted to the information needs of each of several closely related Primary User groups;

(c) a relatively brief Training Circular or other temporary form of literature for each Primary User group;

(d) "change" notices or draft revisions to other agencies for their use in rewriting literature for which they have the MOS responsibility.

NOTE: Packaging separate sections for two or more Primary Users into a single manual can frequently defeat the objective of making the information accessible and useful to each Primary User. Before you decide to put information for more than one Primary User in the same manual, consider how the following disadvantages will affect your Primary Users:

- restricted access to the manual for some;
- consolidated indexes which are hard to use;
- increased bulk which makes it less convenient to use;
- a uniformity of style which may be appropriate for one Primary User group but not for others.

GUIDELINES: PART II - ORGANIZING AND PREPARING THE DRAFT

HAT YOU SHOULD DO AND WHY

TEP 6 - Develop a coherent outline description of WHAT the Primary User (or each Primary User, if more than one) is expected to do in the operational setting.

REASON - Your model for organizing a Performance-Oriented training manual is provided by your description of the Primary User in the field; what he will be expected to do in relation to your topic area, how he should do it, and the conditions under which he will be performing. The duty and task statements you prepare provide this description.

GUIDANCE FOR PERFORMING THE STEP

A duty statement is a description of a major objective or function your user is to accomplish. To qualify as a major duty area (as opposed to a task), it must involve two or more separate acts or sets of behavior—that is, tasks—that are necessary for accomplishment of the objective (the major duty).

The only magic involved in identifying what should be duty statements and what should be task statements is the same magic as is involved in developing a logical, detailed outline for any writing assignment.

But what is your writing assignment? In preparing Performance-Oriented training literature, your writing assignment is not the topic (for example, defense against CBR attack). Instead, the subject of your writing assignment is identified by the activities that the Primary User would have to perform in the operational setting. For example, what he should do, and how he should carry out these activities to defend himself against CBR attack.

Your duty and task statements should tell WHAT the user does; not HOW he does it. In composing duty and task statements, your objective is to compile, in outline form, a coherent description of WHAT the user is expected to do (in relation to your topic area) in the operational setting. Duty statements might be thought of as chapter titles in a book describing the particular user's job (or that part of it related to your topic area). Task statements, in this comparison, are the major section or paragraph headings within the chapters. The major difference from the usual book is that in this case the organizational focus of all of these headings is on WHAT the user is expected to do in the operational setting. The text which you have been asked to write fills in under these headings and subheadings and supplies the HOW.

AIDS TO ACCOMPLISH THIS STEP

NOTE: The Contrast in Organizational Emphasis: Topic vs Performance Oriented Literature.

The traditional model used in organizing training manuals has been the plan of instruction as presented to the student in the classroom. The style of organization of these plans has typically cast basic enabling knowledges as *superordinate* headings or themes, while duties and tasks to be performed in the operational setting have been given *subordinate* status. Thus, the major emphasis has tended to be on "what you need to understand before you can perform the task," as opposed to, "what you need to do in order to perform the task."

Performance Oriented training literature reverses the relative emphasis described above for traditional training literature. In Performance Oriented training literature, the *superordinate* headings and themes focus on "WHAT the user is to do" and "HOW he is to do it." Necessary enabling knowledges are not omitted, but are made *subordinate* to the major "WHAT-to-do" and "HOW-to-do-it" themes.

Thus, the organization of Performance Oriented training literature comes close to the style a supervisor in the operational setting would use in assigning one of his workers a new task and then standing by the worker and talking him through the initial performance.

WHAT YOU SHOULD DO	GUIDANCE FOR PERFORMING THE STEP
STEP 7 - Using your draft outline, apply your technical area knowledge and write the HOW-to-do-it to accompany each WHAT.	Now that you have identified WHAT your Primary User will be expected to do, identify and review technical content literature that will assist you in applying your technical knowledge to produce a description of HOW he should do it.
STEP 8 - Review the draft for usability and readability from the perspective of your Primary User's needs and his operational setting.	In developing the major duty and task statements in Step 6, above, you were undertaking the job of developing a logical outline of WHAT the user is expected to do as seen from the perspective of the operational or performance setting. As a writer, you are already aware that there is no "tried and true" way of accomplishing the organizational task other than laying out organizational outlines; reviewing them based on what you know about the "real world" job; and then revising and repeating this process until it appears you have made a reasonable "fit." Recording a major duty and each of its tasks on separate cards will provide you with a convenient and flexible way of reviewing and reorganizing your outline as you draft it.

CHAPTER 4

YOUR PRIMARY USER'S READING LEVEL AND WHAT IT MEANS

ESTIMATING YOUR PRIMARY USER'S READING LEVEL . . . . Page 26

ESTIMATING THE READING GAP BETWEEN YOU AND YOUR USER . . Page 26

Exercise 1 The "Reading Skill" Gap? . . . . Page 26

Exercise 2 The "Language Skill" Gap? . . . . Page 28

WHAT MAKES WRITING DIFFICULT TO READ?

When Will Your Writing "Turn Off" the Reader? . . . . Page 28

ESTIMATING YOUR PRIMARY USERS' READING LEVEL

HOW WELL DO ARMY ENLISTED PERSONNEL READ?

Reading Ability of Army Enlisted Personnel

Do you know how well the people you are writing for can read? Tests show that, on the average,

Cooks (MOS 94B) Vehicle Drivers (MOS 64A)	read like 7th or 8th grade students.
Tank Crewmen (MOS 11E) Mechanics (MOS 63C) Wiremen (MOS 36K)	read like 8th or 9th grade students.
Supplymen (MOS 76Y) Clerks (MOS 71B, 71H)	read like 9th or 10th grade students.

Additional testing shows that, typically, personnel who have AFQT scores

from	read like	grade students.
10-19	6th	
20-29	7th	
30-39	8th	
40-49	8-9th	
50-59	9th	
60-69	10th	
70-79	11th	
80-89	11-12th	
90+	12+	

So if you are writing for MOSs where larger numbers of lower AFQT personnel are likely to be assigned, you will want to take special care to produce materials the readers can use. But how do you know what kinds of materials people of different reading ability levels can comfortably use? The rest of this chapter is designed to let you develop a better "feel" for the nature of reading, and what it is like to be a poor reader.

ESTIMATING THE READING GAP BETWEEN YOU AND YOUR USER

EXERCISE 1 - HOW LARGE IS THE "READING SKILL GAP" BETWEEN YOU AND YOUR USER?

Using Your Own Reading Skills as a Standard of Comparison

Perhaps the best way to understand what materials different readers can handle well is to pit your own reading ability against others and see how well you compare to them in performing Army reading tasks. If you experience some of the "mental strain" yourself, you may have a better "feel" for the strain a poorer reader will have to tolerate to use manuals, charts, tables, and figures you produce.

On page 27 is a self-test made-up of a table from an Army manual. This test was given to a large group of Army personnel having a wide range of reading abilities. Take the test yourself. Remember, you only have 10 minutes! As you take the test, think about the amount of "mental energy" you are using. Take the test *now*, before you read the rest of this page.

* * * * * * * *

Have you completed the test? You can check your answers using the key in Appendix C. How many did you get right? There are 8 points possible.

When this test was given to a group of supplymen at the end of their Combat Support Training:

Men who read like	graders averaged about	correct.
4th	2.0	
5th	2.2	
6th	3.6	
7th	3.8	
8th	4.2	
9th	5.8	
10th	6.8	
11th+	7-8	

How well did you do? Do you have a better feeling now for what men who read like 7th, 8th, 9th, and 10th graders can do on a reading test? When you took the test, did you notice how much looking back and forth you had to do? How much information you had to hold in your head to look for the answer? How much searching around you had to do to find an answer? Imagine, then, what it must be like to not be able to read, reason, search, and problem solve too well.

Table 1. Operator Preventive Maintenance Checks and Services

Interval and sequence No.	*Item to be inspected*	*Procedure*	*Paragraph Reference*
Weekly*			
1	Facepiece	Inspect faceblank for damage (breaks, holes, or tears), dry rot, brittleness, and permanent set affecting fit. Check deflector tubes, pouch flaps, tabs, and temple pin lugs. Check for damage or missing temple pins and flap buttons; clean if necessary (a white or rust-colored substance (bloom) on the rubber does not mean the mask is not clean).	6*a*, 6*j*, 6*k*, 32
2	Nosecup	Inspect for distortion, proper buttoning, and positioning of the chin portion of the nosecup over the chin stop. Check for torn buttonholes and condition of valve seats and valve disks.	6*g*, 37*b*
3	Eyelenses and eyerings	Inspect for condition of lenses (cracked or broken, or scratched, distorted, or discolored to the extent that vision is affected). Check eyering for damage or corrosion.	6*b*
4	Head harness	Check the head harness for tears, loss of elasticity, and missing or damaged clinch tips.	7
5	Clips-and-buckles	Inspect clips-and-buckles for damage or corrosion.	6*e*
6	Voicemitter-outlet valve assembly.	Visually inspect valve disk and seat, diaphragm assembly, voicemitter-outlet valve frame, and crimping ring. Check for looseness which may permit leakage. Turn lever on frame and check movement of drinking mouthpiece and breathing tube mouthpiece.	6*d*, 39
7	Inlet valve caps	Check the inlet valve caps for proper functioning. Clear the mask (para 26*g*). If the exhaled air escapes around the periphery of the mask, the inlet valve caps are functioning properly. Check the inlet valve caps for airtight seal by inhaling and holding the breath with the inlet valve caps covered. The mask should collapse against the face.	6*i*, 36, 37*a*
8	Filter elements	Make visual inspection to insure that filter elements are properly buttoned in pouches. If the mask has been subjected to abnormal treatment (crushed or wetted), inspect filter elements for damage.	6*h*, 38
9	Canteen cup, eyelens outserts, and waterproofing bag.	Inspect and replace if damaged or missing.	8, 9, 10 40.
10	Carrier	Inspect for damage, wear, and loose or missing fasteners, straps, and strap hardware. Replace or turn in for repair.	11
11	Accessories (when authorized).	Inspect accessories for conditions and replace as necessary.	13, 14, 15, 16.

* Every 6 months under peacetime conditions.

TEST E

Use the table on the left side of the test booklet to answer the questions below. Write your answer on the blank space as directed in the question.

Are there any questions? You have 10 minutes. Please answer all the questions.

1. To properly inspect the voicemitter-outlet valve assembly, which of the following should be checked? (Place an "x" in front of the items to be checked.)

__________ Crimping ring
__________ Missing temple pins
__________ Distortion
__________ Valve disk
__________ Inlet valve caps
__________ Movement of drinking mouthpiece
__________ Rust

2. Place the following items in the correct sequence for inspection. Put a "1" in front of the item to be inspected first; a "2" in front of the second item; and so on.

__________ Check for loss of elasticity in head harness
__________ Visually inspect filter elements
__________ Inspect for missing temple pins
__________ Inspect for discolored lenses
__________ Check movement of drinking mouthpiece
__________ Inspect for distortion of nosecup

3. What is the interval for operator preventive maintenance during peace time conditions?

____

EXERCISE 2 - HOW LARGE IS THE "LANGUAGE SKILL" GAP BETWEEN YOU AND YOUR USER?

Prior Knowledge, Language Skill, and Reading

To be able to read materials with ease, we need to have a lot of prior knowledge about vocabulary, and we need to know a lot about our language. Let us try to illustrate this with another test. Look at the paragraph below. Try to guess what words go into the numbered blanks. (Write your answers on a separate sheet of paper.)

Reading/Language Test

(1) purpose of padding a (2) is to provide more (3) for the patient, to (4) the possibility of pressure 5), and to make it (6) and safer to remove (7) cast.

Stockinet may be (8) next to the skin (9) a padding material for (10) close-fitting and well- (11) cast. It should not (12) used alone for acute (13), where there is excessive (14), or immediately after an (15), since it tends to (16) and may impair circulation. (17) stockinet is used without (18) padding, the fact should (19) noted with indelible pencil (20) the cast, so that (21) the cast is removed (22) electric cutter will be (23) with caution.

Sheet cotton (24) webril bandage can be (25) over the stockinet in (26) to three layers. It (27) be rolled on smoothly (28) the turns overlapping about (29) the width of the (30).

Bony prominences are then padded with pieces of felt.

* * * * * * *

Can you find the correct answers for this test in Appendix C? How well did you do? Did you get 10 or more of the answers correct? When this test was given to a large number of new Army recruits:

About 0% of men who read like 5th graders got 10 correct.

8%	6th
20%	7th
37%	8th
59%	9th
85%	10th and above.

Did you notice that you knew enough about our language to do a pretty good job of guessing *exactly* what word *had* to go in a given slot? Did you notice how your *previous knowledge* (for example: *The* purpose of padding . . .) helped you guess the correct answer? People who do not read well generally do not have as good an understanding of our language, nor as extensive a vocabulary to guess well on these kinds of reading tests. Neither can they read and comprehend this kind of reading material with ease when it is *not* full of blanks!

WHAT MAKES WRITING DIFFICULT TO READ?

WHEN WILL YOUR WRITING "TURN-OFF" THE READER?

Readability, Reading Ability, and Readership

When we talk about the "readability" of a manual, we mean how easy it is to read and comprehend the *style* of writing in the manual. For instance, some manuals use *excessively* (very) long words, rendering explication of mandatory directives ludicrously inexpedient! They may even make it hard to read needed information! Generally speaking, manuals with a readable style will be easier to read and comprehend than less readable manuals. Of course, even good style will not make a poorly designed manual easy to use. But style *can* affect how fast and how well a reader can understand a manual.

To get an idea of the different styles of writing people of different reading skill levels can comfortably read and understand, study the passages on the opposite page. Each passage is from an Army manual. Army personnel having a wide range of reading abilities were asked to read each passage for comprehension testing. The results of this testing are given after each passage. By studying these results, you can see how the readability (difficulty of style) of the passage and the reading abilities of the Army personnel come together to affect how much of the passage is comprehended. You can also see that poorly written material "turns you off," so you are not as likely to read it. Material of low readability usually has a lower *readership*—that is, fewer people read it.

The point is that you should try to write your manual so that the difficulty in seeking, searching and problem solving is held to a minimum. You should try to use language patterns (writing style) that are not complex. This guidebook attempts to help you do this. It will not write for you—it is only an aid. Use it to your reader's advantage.

Passage 1

If you do not have a compass, you can find direction by other methods.

The North Star. North of the equator, the North Star shows you true north. To find the North Star—

Look for the Big Dipper. The two stars at the end of the bowl are called the "pointers." In a straight line out from the pointers is the North Star (at about five times the distance between the pointers). The Big Dipper rotates slowly around the North Star and does not always appear in the same position.

You can also use the constellation Cassiopeia. This group of five bright stars is shaped like a lopsided M (or W, when it is low in the sky). The North Star is straight out from the center star about the same distance as from the Big Dipper. Cassiopeia also rotates slowly around the North Star and is always almost directly opposite the Big Dipper.

In taking the comprehension test for Passage 1, of the personnel who read at the 4th grade level 36% got 70% correct.

5th	25%
6th	75%
7th	87%
8th+	90-100%

Thus, Passage 1 appears roughly suitable for people with reading ability levels above the 5th grade.

Passage 2

Application of Pressure Dressing:

The application of a sterile dressing with pressure to a bleeding wound helps clot formation, compresses the open blood vessels, and protects the wound from further invasion of germs. The following procedure should be used when a person is wounded.

Look for more than one wound. For example, a missile may have come out at another point. The wound where a missile comes out is usually larger than the one where it enters.

Cut the clothing and lift it away from the wound to avoid further contamination. Tearing the clothing might result in rough handling of the injured part. Do not touch the wound; keep it as clean as possible. If it is already dirty, leave it that way. Do not try to clean it in any way.

Cover the wound with a first aid dressing and apply pressure to the wound by use of the bandages attached to the dressing.

In taking the comprehension test for Passage 2, of the personnel who read at the 4th grade level 12% got 70% correct.

5th	21%
6th	36%
7th	54%
8th	81%
9th+	93%

Passage 2 is clearly less readable than Passage 1, and would be roughly suitable for personnel reading above the 7th grade level.

Passage 3

Adequate protection from the elements and environmental conditions must be provided by means of proper storage facilities, preservation, packaging, packing, or a combination of any or all of these measures. To adequately protect most items from the damaging effects of water or water-vapors, adequate preservation must be provided. This is often true even though the item is to be stored in a warehouse provided with mechanical means of controlling the temperature and humidity. Several methods by which humidity is controlled are in use by the military services. Use is also made of mechanically ventilating and dehumidifying selected sections of existing warehouses. Appropriate consideration will be given to the preparation and care of items stored under specific types of storage such as controlled humidity, refrigerated, and heated. The amount and levels of preservation, packaging, and packing will be governed by the specific method of storage plus the anticipated length of storage.

On the comprehension test for Passage 3, of the personnel who read at the 4th grade level 0% got 70% correct.

5th	0%	9th	21%
6th	0%	10th	29%
7th	8%	11th	52%
8th	12%	12th+	66%

Passage 3 is very difficult indeed! It should pose a problem for people reading as well as the 9th or 10th grade level. Look at Passage 1 and then at Passage 3. You can actually *see* the difference. Later Chapters in this Guidebook will give you help in making your writing style more readable.

CHAPTER 5

WRITING AND REVISING—A BEFORE AND AFTER GUIDE

DESCRIPTION OF LEGEND ON BEFORE AND AFTER EXAMPLES . . . . Page 32

DESCRIPTION OF THE REWRITE PROBLEMS ILLUSTRATED IN THE EXAMPLES

The Reading Level Is Too High - Hard Words, Long Sentences . . . . Page 33
Topic Oriented Writing - Not Direct . . . . Page 34
Main Points Are Lost in the Detail - Too Vague, Too Wordy . . . . Page 34
Confused Development - Confusing . . . . Page 36
Remote References . . . . Page 37
Weak Visual Aids . . . . Page 38
Needs Visual Chunking - Run-Together Format . . . . Page 38

BEFORE AND AFTER EXAMPLES - INDEX . . . . Page 39

DESCRIPTION OF LEGEND ON BEFORE AND AFTER EXAMPLES

The examples in this section each [illegible] legend such as those below.

BEFORE

Type of Literature: FIELD ARTILLERY - COMBAT
Rewrite Problem(s):
- LONG SENTENCES
- NOT DIRECT
- CONFUSING
- REMOTE REFERENCES
- WEAK VISUAL AIDS
- RUN-TOGETHER FORMAT

No. of 1 Syll. words/Total No. words: 230/365=63%
FORCAST Reading Grade Level Score: 10.5

AFTER

Type of Literature: FIELD ARTILLERY - COMBAT

Primary User: WORKER
Information Objectives: WHAT TO DO

No. of 1 Syll. words/Total No. words: 234/321=73%
FORCAST Reading Grade Level Score: 9.0

Type of Literature:
Gives the content area (such as Field Artillery) and whether the treatment is technical, combat related, or administrative.

Rewrite Problem(s):
Refers to trouble spots in the writing of the Before passage. (Details are given in "A Guide to Rewrite Problems," page 33.)

Primary User:
Gives the type of primary user that we wrote the After version to. (Most After passages are written for the Worker, but a few are for the Direct Supervisor, Unit Commander, or Instructor.)

Information Objectives: Tells how we organized the information to resolve the Rewrite Problems in the Before passage. It gives the main focus of the information that we are giving to the primary user.

No. of 1 Syll. words/Total No. words:
FORCAST Reading Grade Level Score:
Gives length of passage (Total No. words) and estimated Reading Grade Level. (See details in "A Guide to Rewrite Problems," on page 33.)

DESCRIPTION OF THE REWRITE PROBLEMS ILLUSTRATED IN THE EXAMPLES

A GUIDE TO REWRITE PROBLEMS

A review of Army training manuals reveals a number of writing problems which can be summarized in seven key trouble points. These seven trouble points are illustrated through the series of Before and After examples which begin on page 32. The specific trouble points in each example are listed in the legend under "Rewrite Problem(s)." This section will tell you what those labels mean.

1. The Reading Level is Too High—HARD WORDS, LONG SENTENCES

(a) *Hard words* are generally multisyllable words and words which may be unfamiliar. Hard words may be single words or phrases. When you review your draft, you can get a fast estimate of the reading level of a passage by finding the percentage of one-syllable words out of the total number of words. The higher the percentage is, the lower the reading grade level. For example, 60% indicates a reading grade level of 11.0, while 73% indicates a level of 9.0. This measure is not the standard FORCAST, but you can use it to get a rough idea of your writing level. We have used this method to show the differences in our Before and After plates.

Examples of HARD WORDS

(From page 118)

designated representative
constitutes
credit instrument
delegated
initiated
declines to admit liability
monetary limitation
vehicular damage

Percentage of One-Syllable Words	FORCAST Reading Grade Level Score
87	7
80	8
73	9
67	10
60	11
53	12
47	13

(b) *A long sentence* may be defined as a sentence which has more than 17 words in it. You should avoid sentences which are long. Keep the average length of your sentences under 17 words per sentence.

Examples of LONG SENTENCES

1. The gunner then lays his direct-fire sight on the far reference light and, using the resetter knob on his azimuth indicator, indexes the deflection reading for the far reference stake. (From page 56.)
2. The M7 special nonelectric blasting caps are flared at the open end for easy insertion of the time fuse and are the standard issue nonelectric blasting caps. (From page 62.)
3. Remember that although biological agents can enter your body through contaminated food, water, and objects and by vector bites, the main danger in a biological agent attack is breathing the agent aerosols. (From page 108.)

2. Topic-Oriented Writing—NOT DIRECT

When we say that a passage is *not direct*, we mean that it is topic-oriented instead of performance-oriented. The writing is not direct because it does not relate directly to the job information needs of any particular user.

(a) The writing may tell "about" something rather than "what to do" or "how to do it." In such a case, the writing has no relation at all to a specific task.

(b) The writing may treat a job or task in such a way that it tries to help *any* user who might have to do all or part of the task. This kind of writing often leads to a general discussion of a job without giving enough job relevant information to any one particular user. For more details, refer back to Chapter 2 on topic-oriented writing.

Example of Writing That is NOT DIRECT

Before (From page 44)

a. *Terrain Masking.* Terrain masking results from the existence of mountains, hills, trees, and buildings between the gunner and the target. The local terrain profile will influence the distance at which low-altitude targets will be unmasked; i.e., not be hidden behind a hill or other terrain features. Terrain masking is a primary consideration in establishing a Redeye air defense, and its effect can be minimized by proper site selection.

After (From page 45)

d. *Choosing Observer Sites.* The site you pick for an observer will affect how far away he can spot targets. Mountains, hills, trees, and buildings may hide a low-flying target from the observer. This is called *terrain masking.* Choose a site where the terrain has a low profile, so it will not mask targets.

The observer has to pick out an aircraft from the background it is flying against. He can see an aircraft that contrasts with its background better than one that is camouflaged to blend with the background. For example, most aircraft blend well with a background of mountains. When you pick an observer site, be sure to think about the background in the direction the targets will probably come from.

3. The Main Points are Lost in the Detail—TOO VAGUE, TOO WORDY

As you write a paragraph, you should make sure that your main points stand out clearly. Don't let your writing become vague or wordy.

(a) *Vague.* When we say that a passage is vague, we mean that it lacks proper subordination. Main points and secondary points are run together as if they were equally important. The reader must handle several "equal" details rather than a few main points together with the information which supports each of them. The passage lacks needed emphasis.

Example of Writing That is TOO VAGUE

Before (From page 54)

c. *Crew Duties.*

(1) *Vehicle commander.*

(a) Since the conventional round can be fired from a stationary vehicle or a moving vehicle in the stabilized mode, after acquiring a target the vehicle commander must issue directions to the driver before issuing the initial fire command. If the vehicle commander desires to fire from a stationary vehicle, he announces DRIVER STOP. If the vehicle commander desires to continue moving while firing he announces STABILIZED, and then issues the fire command.

After (From page 55)

CREW DUTIES DURING TARGET ENGAGEMENT

(1) Duties of the vehicle commander

(a) The vehicle commander picks a target.

(b) He decides whether to fire with the vehicle moving or stopped. If he wants to fire while the vehicle is stopped, he says DRIVER STOP. If he wants to fire while the vehicle is moving, he says STABILIZED.

(b) A passage that is *too wordy* may have two different problems.

(1) *Too much detail.* Too much detail is usually the result of writing to more than one user or of writing to no particular user at all. Write to *your* primary user. Give him all the information that he needs to perform his job. Leave out everything else.

Example of Writing That is TOO WORDY (Too much detail)

Before (From page 58)	After (From page 59)
e. Several tracked vehicles are air transportable. Tracked vehicles are usually moving long distances by being transported rather than by proceeding under their own power. Instructions for loading vehicles on aircraft are provided in the technical manuals of the 10-500 series. Rail movement is probably used most. In continental United States, the Association of American Railroads has a standard loading plan that specifies the minimum lashing and blocking for each type vehicle. Since there are different maximum requirements among the different rail lines, the nearest agent will have been consulted for particulars when vehicles are to be loaded on railroad cars. Each unit usually becomes responsible for loading its own vehicles—it is necessary that you learn how your vehicle must be loaded. The technical manual for each type vehicle gives the minimum requirements of the Army for loading and lashing the vehicle. These requirements usually closely parallel those of the railroad lines. If you are familiar with the requirements in the technical manual it will be very easy to adapt to any additional requirements of the rail line.	e. *Moving long distances.* Tracked vehicles are not usually driven long distances. Instead, they are moved by rail or by air. Each unit loads its own vehicles, so you need to know how to load your vehicle and tie it down. You will find this information in the technical manual for your vehicle. Learn it. If you need to, you can add to this basic information the requirements of the railroad line or of the particular type of aircraft.

(2) *Redundant.* The passage may needlessly repeat some of the information. Such redundancy may destroy the emphasis that you wish to place. The passage becomes too wordy and the main points may not stand out. Consolidate your main points before you present them.

Example of Writing That is TOO WORDY (Redundant)

(From page 134)

a. *Rear Taillights.* Each rear lamp has two pairs of "cat's eyes" which show red when on. Each appears as one red light when you are 180 to 60 feet (60 to 20 yards); and as two pairs of "cat's eyes" in each light at less than 60 feet (Fig. 50). Remember, one point of light informs you that you are too far behind the vehicle ahead; two lights assure you that you are following at a proper distance; and four lights warn that you are getting too close. The blackout stoplight is part of the right rear taillight. It flashes a white light when brakes are applied.

4. Confused Development–CONFUSING

When you write a series of paragraphs or passages, your writing will become *confusing* if you do not clearly develop and sequence your main points. Avoid all of these problems which lead to confusing writing:

(a) Redundancy between paragraphs. When you think that you are making two different points, be sure that one isn't really a restatement of the other. If it is, you would do better to combine the two.

Example of Writing that is CONFUSING (Redundant)

Before (From page 128)

(1) Antennas should be located on hills overlooking the surrounding terrain and jungle growth.

. . . .

(4) Antennas should be located as high as possible when the antenna site is located directly behind an intervening terrain mask. If feasible, tie the radio set to the top of a tree and operate it from that location by remote control. Slight tilting of an antenna away from the direction of the distant station also will help to breach an obstacle.

(5) Antennas should not be located in narrow valleys or between ridges or stretches of high jungle growth.

. . . .

After (From page 129)

b. *Height of antenna.* If you can, place antennas on hills or other high spots. The signal will then pass through less jungle growth and have a greater range. Never place your antenna in deep narrow valleys. When the growth or terrain is very close, place the antenna as high up as you can. Tie the radio set to the top of a tree if possible, and run it by remote control.

(b) *Missing information.* When your writing does not give your user all the job relevant information that he needs to do his job, the writing has missing information. You should think and write in terms of your user's job requirements. If you do not, you risk leaving out information that he might need to know.

?

(c) *Scattered information*. In the same way, different information about the same main point should be together and not scattered throughout different paragraphs. Organize your information.

Example of Writing That is CONFUSING) (Scattered Information)

(From page 86)

The squad leader's responsibilities during the preparation of the position include:

a. refers to weapons.	(a) Coordinating with crews and gunners of all weapons located in the squad area.
b. refers to positions.	(b) Supervising the preparation of foxholes.
c. refers to range cards.	(c) Supervising the preparation of range cards to include assisting in the estimation of ranges to prominent terrain features.
d. refers to fire.	(d) Insuring provision for delivery of fires under conditions of limited visibility, to include improvised procedures for delivery of grazing fire by rifles and automatic rifles and prearranged grenade launcher fires.
e. refers to fire.	(e) Supervising the clearing of fields of fire.
f. refers to positions.	(f) Supervising the preparation of supplementary positions.
g. refers to positions.	(g) Inspecting positions to insure that camouflage and overhead covers are sufficient.
h. refers to weapons.	(h) Insuring that all weapons have their battlesight setting and are operative, and that adequate ammunition is available and distributed.
i. refers to range cards.	(i) Preparing a sketch in duplicate of the squad's sector of fire, showing prominent landmarks or terrain features and the ranges to them. He gives one sketch to the platoon leader and keeps one copy for himself.

5. Remote References—REMOTE REFERENCES

In general, a *remote reference* is any reference to text or illustration which is not on the same page as the reference or on the facing page. The material which you present to the reader should be as self-contained as possible. Illustrations should be on the same page as the text, or on the facing page.

Example of REMOTE REFERENCES

(From page 94)

a. *Maintain Adequate Respiration and Heartbeat.* To maintain adequate respiration and heartbeat, you may need to do nothing more than clear the casualty's upper airway (para 7), position him to insure adequate drainage of any fluid obstructing his airway (f below), and observe him to insure that his airway remains unobstructed. You may need to administer artificial respiration and closed-chest heart massage (para 8 and 9).

b. *Control Bleeding.* Control bleeding application of pressure dressing, by elevation of part, and by use of pressure points as appropriate (para 11c(2)). Apply tourniquet if necessary (para 12).

6. Weak Visual Aids–WEAK VISUAL AIDS

A *weak visual aid* can refer to one of two conditions:

1. No visual aid where one would help.
2. A visual aid that is not designed in a way that helps the user.

In general, you should judge the adequacy of a visual aid by looking at both the aid and the text. A strong visual aid may substitute for the text or lighten the detail burden in the text. It may also reinforce, highlight, or summarize information from the text. Refer to Chapter 6 for more details about visual aids.

Example of WEAK VISUAL AID

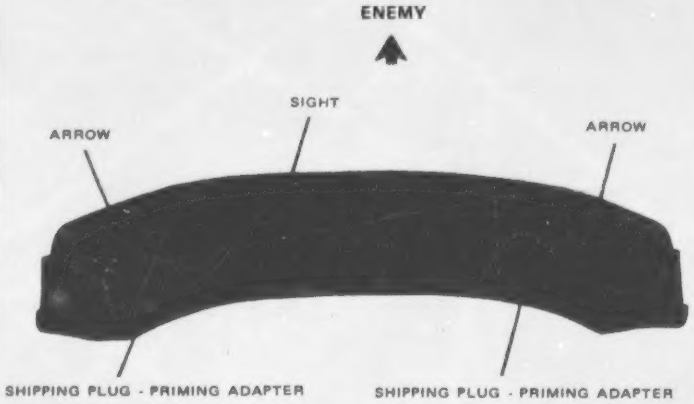

ENEMY
SIGHT
ARROW
ARROW
SHIPPING PLUG - PRIMING ADAPTER
SHIPPING PLUG - PRIMING ADAPTER

Figure 10. Top view of the M18A1 antipersonnel mine.

7. Needs Visual Chunking–RUN-TOGETHER FORMAT

A *run-together format* is a solid mass of print. The reader cannot easily scan it. He cannot easily identify and lift out the separate points. The solution to a run-together format is to break the text up into visual "chunks" which group the information logically. Proper visual chunking lets the reader scan and identify the separate points easily.

Example of RUN-TOGETHER FORMAT

Before (From page 56)

b. *Reoccupation of Position.* When the firing position is to be reoccupied, white tape is stretched between the two ground stakes to facilitate alignment of the tank's right or left track. With the shielded lights on the aiming stakes turned on, the gun is traversed to the angle of the aiming stakes and the tank is moved forward adjacent to the tape (fig 14-6). The gunner controls the final positioning of the tank by observing through his sight until the far light appears to be above and in line with the near light at which time the tank is halted. The gunner then, using the resetter knob on the azimuth indicator, indexes the pre-recorded deflection to the aiming stakes. The tank is now positioned so that the range card data can be used to engage targets.

After (From page 57)

b. *How to Move into a Marked Position*

(1) Crewmen stretch white tape between the two ground stakes to help position the tank's track.

(2) They turn on the lights on the two aiming stakes.

(3) The gunner moves the turret to the angle of the aiming stakes.

(4) The driver moves the tank up next to the tape.

(5) The driver stops the tank when the gunner sees the far light above the near light, and in line with it.

(6) The gunner uses the resetter knob on the azimuth indicator to index the pre-recorded deflection to the lighted aiming stakes.

(7) The tank is now in position to use the range card data.

BEFORE AND AFTER EXAMPLES - INDEX

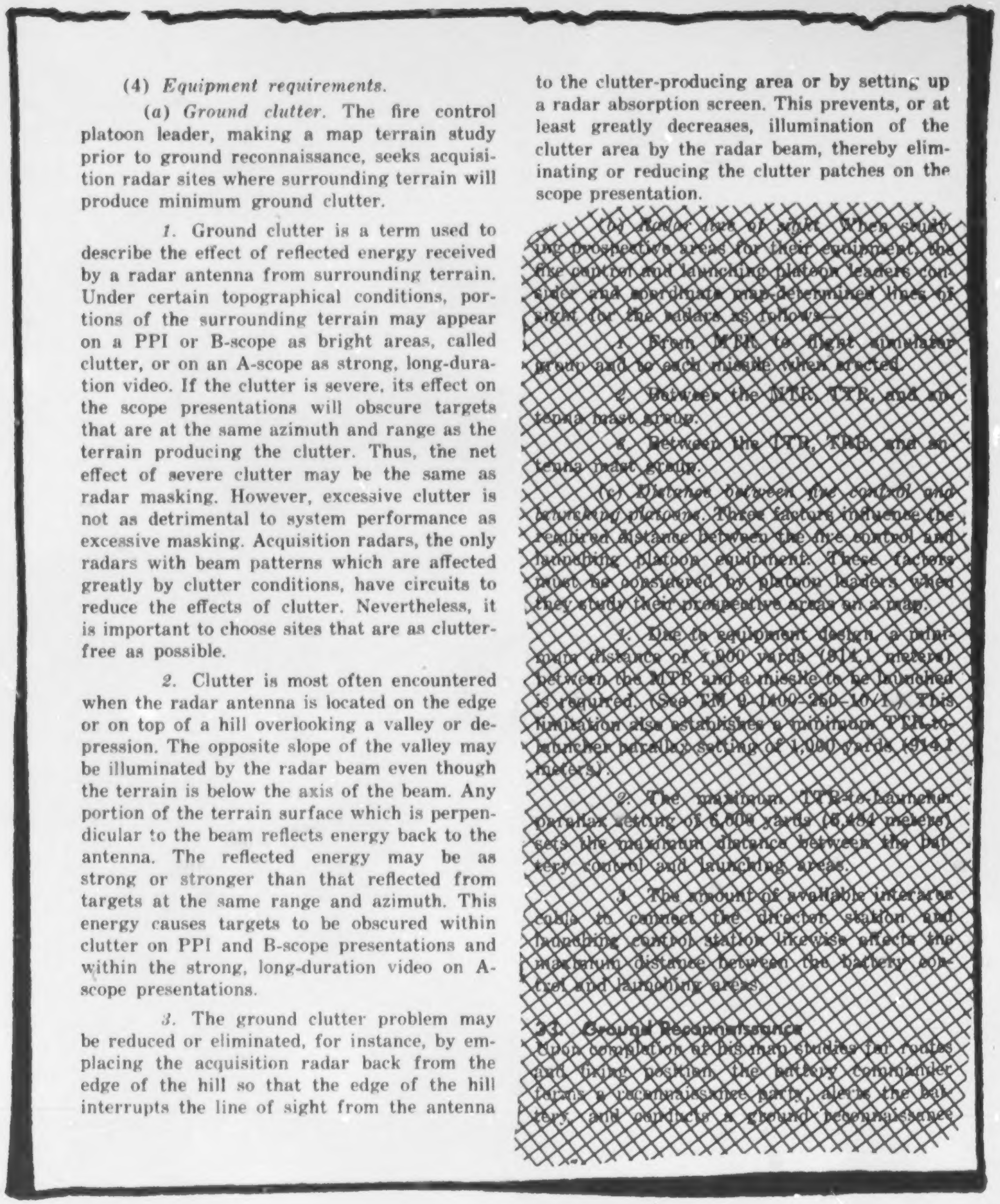
REWRITE PROBLEMS IN "BEFORE" EXAMPLE

Type of Literature	Hard Words	Long Sentences	Not Direct	Too Vague	Too Wordy	Confusing	Remote References	Weak Visual Aids	Run-Together Format	Example Pages
Air Defense										
Technical		●		●		●				40 - 41
Combat	●	●	●			●				42 - 45
Administrative	●	●	●		●	●				46 - 47
Armor										
Technical	●		●		●			●	●	48 - 51
Combat	●	●	●	●	●	●	●		●	52 - 59
Engineer										
Technical	●			●	●	●	●	●	●	60 - 63
Field Artillery										
Combat		●	●			●	●	●	●	64 - 69
Infantry										
Technical	●	●	●		●	●	●	●	●	70 - 79
Combat	●	●	●	●	●	●	●	●	●	80 - 89
Medic										
Technical	●		●		●		●	●	●	90 - 99
Military Police										
Technical	●	●		●	●	●			●	100 - 105
Ordnance										
Technical		●			●		●	●		106 - 107
Combat		●			●				●	108 - 111
Quartermaster										
Technical	●	●	●	●	●	●			●	112 - 115
Administrative	●	●	●	●	●	●		●	●	116 - 121
Signal										
Technical	●		●	●	●	●			●	122 - 129
Transportation										
Technical	●	●	●		●	●	●	●	●	130 - 135

Type of Literature: **AIR DEFENSE-TECHNICAL**
Rewrite Problem(s):
LONG SENTENCES
TOO VAGUE
CONFUSING

No. of 1 Syll. words/Total No. words: 201/358=56%
FORCAST Reading Grade Level Score: 11.6

B
E
F
O
R
E



(4) *Equipment requirements.*

(*a*) *Ground clutter.* The fire control platoon leader, making a map terrain study prior to ground reconnaissance, seeks acquisition radar sites where surrounding terrain will produce minimum ground clutter.

1. Ground clutter is a term used to describe the effect of reflected energy received by a radar antenna from surrounding terrain. Under certain topographical conditions, portions of the surrounding terrain may appear on a PPI or B-scope as bright areas, called clutter, or on an A-scope as strong, long-duration video. If the clutter is severe, its effect on the scope presentations will obscure targets that are at the same azimuth and range as the terrain producing the clutter. Thus, the net effect of severe clutter may be the same as radar masking. However, excessive clutter is not as detrimental to system performance as excessive masking. Acquisition radars, the only radars with beam patterns which are affected greatly by clutter conditions, have circuits to reduce the effects of clutter. Nevertheless, it is important to choose sites that are as clutter-free as possible.

2. Clutter is most often encountered when the radar antenna is located on the edge or on top of a hill overlooking a valley or depression. The opposite slope of the valley may be illuminated by the radar beam even though the terrain is below the axis of the beam. Any portion of the terrain surface which is perpendicular to the beam reflects energy back to the antenna. The reflected energy may be as strong or stronger than that reflected from targets at the same range and azimuth. This energy causes targets to be obscured within clutter on PPI and B-scope presentations and within the strong, long-duration video on A-scope presentations.

3. The ground clutter problem may be reduced or eliminated, for instance, by emplacing the acquisition radar back from the edge of the hill so that the edge of the hill interrupts the line of sight from the antenna to the clutter-producing area or by setting up a radar absorption screen. This prevents, or at least greatly decreases, illumination of the clutter area by the radar beam, thereby eliminating or reducing the clutter patches on the scope presentation.

(*b*) *Radar line of sight.* When studying prospective areas for their equipment, the fire control and launching platoon leaders consider and coordinate map-determined lines of sight for the radars as follows—

1. From MTR to flight simulator group and to each missile when erected.

2. Between the MTR, TTR, and antenna mast group.

3. Between the TTR, TRR, and antenna mast group.

(*c*) *Distance between fire control and launching platoons.* Three factors influence the required distance between the fire control and launching platoon equipment. These factors must be considered by platoon leaders when they study their prospective areas on a map.

1. Due to equipment design, a minimum distance of 1,000 yards (914.4 meters) between the MTR and a missile to be launched is required. (See TM 9-1400-250-10/1.) This limitation also establishes a minimum TTR-to-launcher parallax setting of 1,000 yards (914.4 meters).

2. The maximum TTR-to-launcher parallax setting of 6,000 yards (5,484 meters) sets the maximum distance between the battery control and launching areas.

3. The amount of available interarea cable to connect the director station and launching control station likewise affects the maximum distance between the battery control and launching areas.

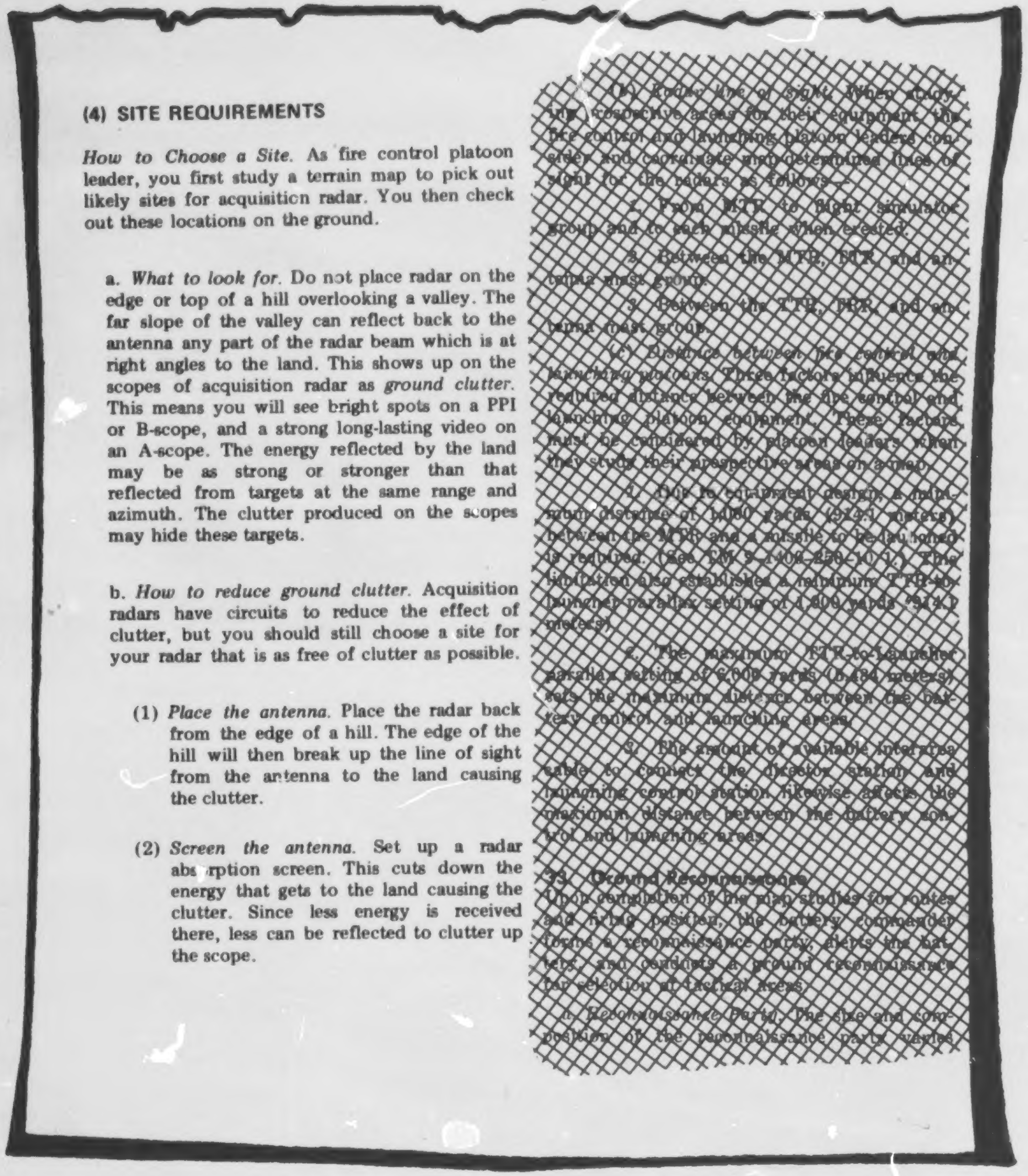
33. Ground Reconnaissance

Upon completion of his map studies for routes and firing position, the battery commander forms a reconnaissance party, alerts the battery, and conducts a ground reconnaissance

Type of Literature: AIR DEFENSE - TECHNICAL

Primary User: UNIT COMMANDER
Information Objectives: WHAT TO DO ; HOW IT DOES IT

No. of 1 Syll. words/Total No. words: 189/250=76%
FORCAST Reading Grade Level Score: 8.6



(4) SITE REQUIREMENTS

How to Choose a Site. As fire control platoon leader, you first study a terrain map to pick out likely sites for acquisition radar. You then check out these locations on the ground.

a. *What to look for.* Do not place radar on the edge or top of a hill overlooking a valley. The far slope of the valley can reflect back to the antenna any part of the radar beam which is at right angles to the land. This shows up on the scopes of acquisition radar as *ground clutter.* This means you will see bright spots on a PPI or B-scope, and a strong long-lasting video on an A-scope. The energy reflected by the land may be as strong or stronger than that reflected from targets at the same range and azimuth. The clutter produced on the scopes may hide these targets.

b. *How to reduce ground clutter.* Acquisition radars have circuits to reduce the effect of clutter, but you should still choose a site for your radar that is as free of clutter as possible.

(1) *Place the antenna.* Place the radar back from the edge of a hill. The edge of the hill will then break up the line of sight from the antenna to the land causing the clutter.

(2) *Screen the antenna.* Set up a radar absorption screen. This cuts down the energy that gets to the land causing the clutter. Since less energy is received there, less can be reflected to clutter up the scope.

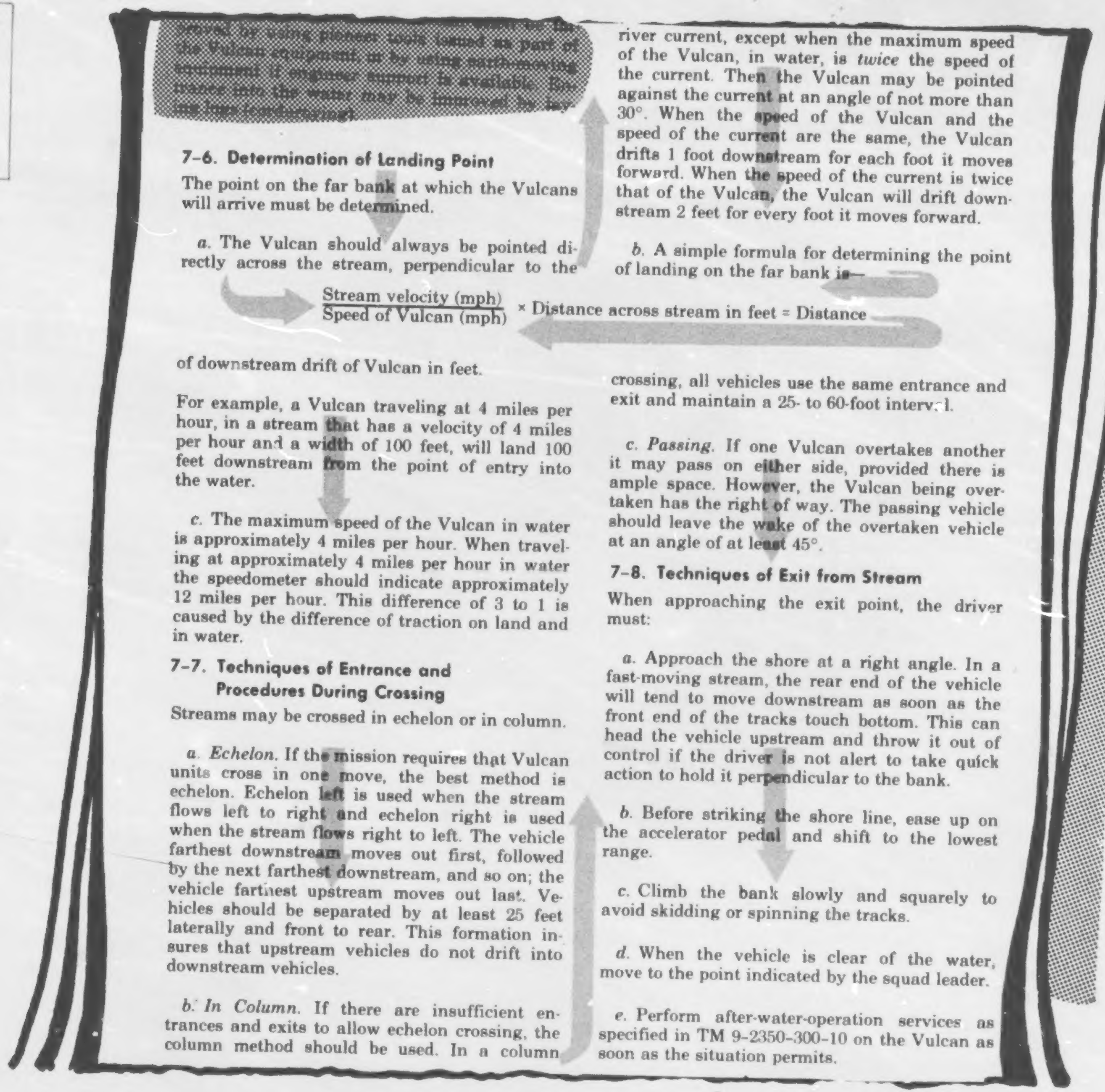
[redacted]

A F T E R

Type of Literature: AIR DEFENSE - COMBAT
Rewrite Problem(s):
NOT DIRECT
FORMAT PUZZLE

No. of 1 Syll. words/Total No. words: 390/575=68%
FORCAST Reading Grade Level Score: 9.8

BEFORE



graded by using pioneer tools issued as part of the Vulcan equipment, or by using earth-moving equipment if engineer support is available. Entrances into the water may be improved by laying logs (corduroying).

7-6. Determination of Landing Point

The point on the far bank at which the Vulcans will arrive must be determined.

a. The Vulcan should always be pointed directly across the stream, perpendicular to the river current, except when the maximum speed of the Vulcan, in water, is *twice* the speed of the current. Then the Vulcan may be pointed against the current at an angle of not more than 30°. When the speed of the Vulcan and the speed of the current are the same, the Vulcan drifts 1 foot downstream for each foot it moves forward. When the speed of the current is twice that of the Vulcan, the Vulcan will drift downstream 2 feet for every foot it moves forward.

b. A simple formula for determining the point of landing on the far bank is—

$$\frac{\text{Stream velocity (mph)}}{\text{Speed of Vulcan (mph)}} \times \text{Distance across stream in feet} = \text{Distance}$$

of downstream drift of Vulcan in feet.

For example, a Vulcan traveling at 4 miles per hour, in a stream that has a velocity of 4 miles per hour and a width of 100 feet, will land 100 feet downstream from the point of entry into the water.

c. The maximum speed of the Vulcan in water is approximately 4 miles per hour. When traveling at approximately 4 miles per hour in water the speedometer should indicate approximately 12 miles per hour. This difference of 3 to 1 is caused by the difference of traction on land and in water.

7-7. Techniques of Entrance and Procedures During Crossing

Streams may be crossed in echelon or in column.

a. Echelon. If the mission requires that Vulcan units cross in one move, the best method is echelon. Echelon left is used when the stream flows left to right and echelon right is used when the stream flows right to left. The vehicle farthest downstream moves out first, followed by the next farthest downstream, and so on; the vehicle farthest upstream moves out last. Vehicles should be separated by at least 25 feet laterally and front to rear. This formation insures that upstream vehicles do not drift into downstream vehicles.

b. In Column. If there are insufficient entrances and exits to allow echelon crossing, the column method should be used. In a column crossing, all vehicles use the same entrance and exit and maintain a 25- to 60-foot interval.

c. Passing. If one Vulcan overtakes another it may pass on either side, provided there is ample space. However, the Vulcan being overtaken has the right of way. The passing vehicle should leave the wake of the overtaken vehicle at an angle of at least 45°.

7-8. Techniques of Exit from Stream

When approaching the exit point, the driver must:

a. Approach the shore at a right angle. In a fast-moving stream, the rear end of the vehicle will tend to move downstream as soon as the front end of the tracks touch bottom. This can head the vehicle upstream and throw it out of control if the driver is not alert to take quick action to hold it perpendicular to the bank.

b. Before striking the shore line, ease up on the accelerator pedal and shift to the lowest range.

c. Climb the bank slowly and squarely to avoid skidding or spinning the tracks.

d. When the vehicle is clear of the water, move to the point indicated by the squad leader.

e. Perform after-water-operation services as specified in TM 9-2350-300-10 on the Vulcan as soon as the situation permits.

7-6 Planning the Landing Point

You should pick out your landing point before you enter the river. While in the water you will usually be trying to keep the Vulcan pointed straight across the river. The river current will still make the Vulcan drift downstream. So to plan your landing point you need to know how far downstream you will be when you reach the other side.

Use this formula to find out how far downstream your Vulcan will drift:

$$\text{Drift(ft)} = \frac{\text{current (mph)}}{\text{Vulcan (mph)}} \times \text{river width(ft)}$$

Example: River Current speed is 2 miles per hour (mph)
Vulcan speed is 4 miles per hour (mph)
Width of river is 100 feet.

$$\text{Drift} = \frac{2\text{ mph}}{4\text{ mph}} \times 100\text{ ft.}$$

Answer: Drift = *50 feet*

The top speed of the Vulcan in water is about 4 miles per hour. Keep in mind that when the Vulcan's in water, its speedometer will read 3 times faster than its actual speed. For example, if you were really moving at 4 miles per hour in water, the speedometer would read 12 miles per hour. This is caused by the different traction in water than on land. Use the actual speed in the formula. You will then know how far downstream your landing point should be.

7-7 Entering and Crossing the Stream

Streams may be crossed in echelon or in column formation.

a. *Echelon.* The formation can only be used when each Vulcan can enter and exit at its own point. Entry points along the bank must be at least 25 feet apart. The Vulcan which is farthest downstream moves out first. When it has gone about 25 feet out into the water, the Vulcan next to it moves out, and so on. The Vulcan farthest upstream moves out last. When you are crossing, keep at least 25 feet away from all the other Vulcans.

b. *Column.* When each Vulcan can not have its own river entrance and exit point, the column formation is used. Each Vulcan enters the river and leaves the river at the same point. When it is your turn to enter, move out when the Vulcan in front of you has gone 25 to 60 feet into the stream.

c. *During Crossing: Passing.* If your Vulcan overtakes another Vulcan, you may pass on either side if you have enough space. The Vulcan in front of you has the right of way. When you pass, you should leave the wake of the other Vulcan at an angle of at least 45°.

7-8 Leaving the Stream

Approach the landing point in this way:

a. Approach the shore at a right angle

* * CAUTION * *

Be alert in water that is moving fast. The rear end of the vehicle will tend to move downstream as soon as the front end of the tracks touch bottom. If you do not keep your Vulcan at right angles to the bank, you may lose control of it.

b. Before you hit the shore line, ease up on the accelerator pedal and shift to the lowest range.

c. Climb the bank slowly and squarely to avoid skidding or spinning the tracks.

d. When your Vulcan is clear of the water, move to the point indicated by your squad leader.

e. As soon as you can take care of the servicing the Vulcan needs after it has been in the water. See TM 9-2350-300-10 for details.

Type of Literature: AIR DEFENSE - COMBAT

Primary User: WORKER
Information Objectives: WHAT TO DO

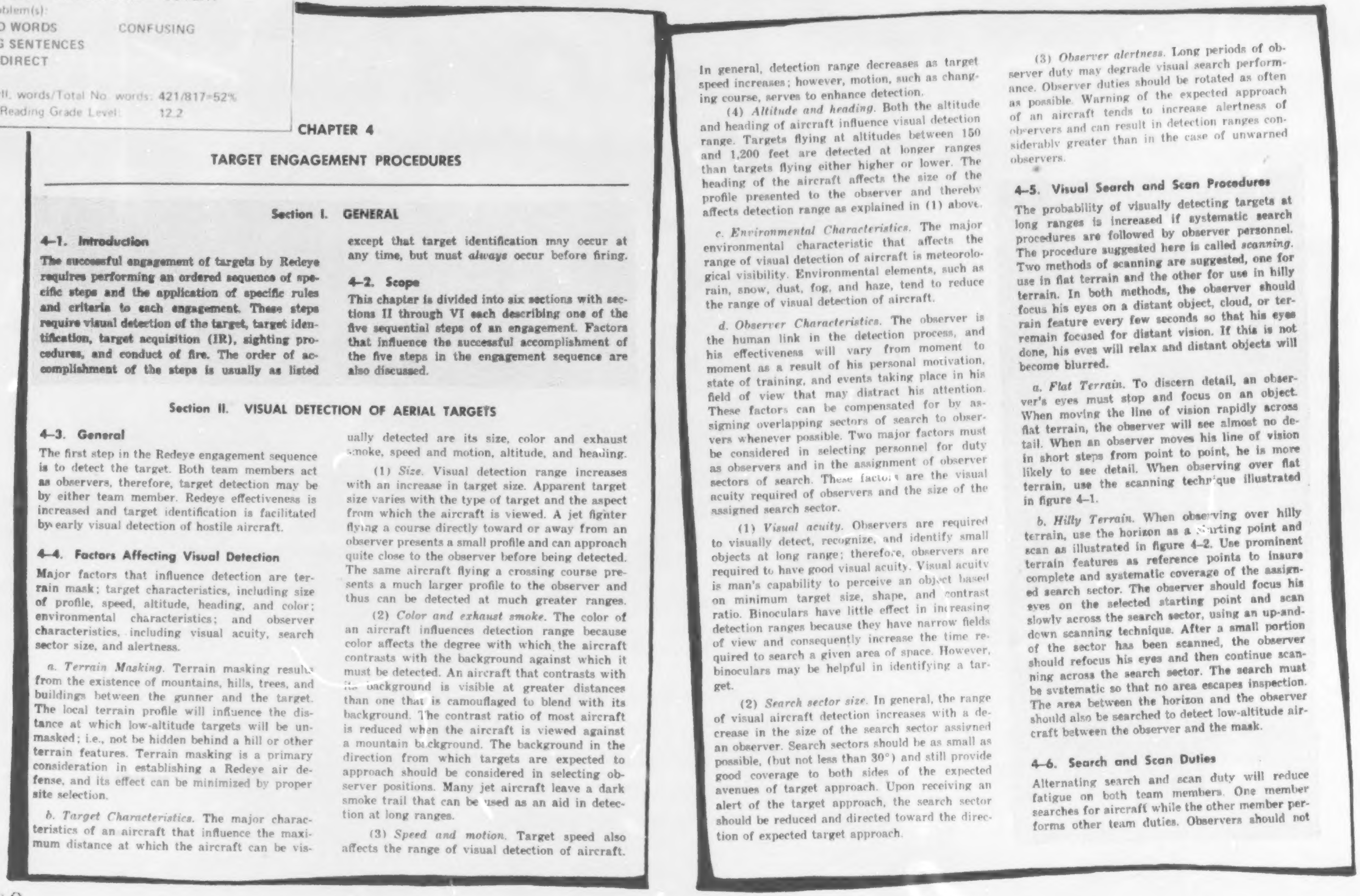
No. of 1 Syll. words/Total No. words: 399/560=71%
FORCAST Reading Grade Level Score: 9.3

AFTER

Type of Literature: AIR DEFENSE – COMBAT
Rewrite Problem(s):
HARD WORDS CONFUSING
LONG SENTENCES
NOT DIRECT

No. of 1 Syll. words/Total No. words: 421/817=52%
FORCAST Reading Grade Level: 12.2

BEFORE



CHAPTER 4

TARGET ENGAGEMENT PROCEDURES

Section I. GENERAL

4–1. Introduction

The successful engagement of targets by Redeye requires performing an ordered sequence of specific steps and the application of specific rules and criteria to each engagement. These steps require visual detection of the target, target identification, target acquisition (IR), sighting procedures, and conduct of fire. The order of accomplishment of the steps is usually as listed except that target identification may occur at any time, but must *always* occur before firing.

4–2. Scope

This chapter is divided into six sections with sections II through VI each describing one of the five sequential steps of an engagement. Factors that influence the successful accomplishment of the five steps in the engagement sequence are also discussed.

Section II. VISUAL DETECTION OF AERIAL TARGETS

4–3. General

The first step in the Redeye engagement sequence is to detect the target. Both team members act as observers, therefore, target detection may be by either team member. Redeye effectiveness is increased and target identification is facilitated by early visual detection of hostile aircraft.

4–4. Factors Affecting Visual Detection

Major factors that influence detection are terrain mask; target characteristics, including size of profile, speed, altitude, heading, and color; environmental characteristics; and observer characteristics, including visual acuity, search sector size, and alertness.

a. Terrain Masking. Terrain masking results from the existence of mountains, hills, trees, and buildings between the gunner and the target. The local terrain profile will influence the distance at which low-altitude targets will be unmasked; i.e., not be hidden behind a hill or other terrain features. Terrain masking is a primary consideration in establishing a Redeye air defense, and its effect can be minimized by proper site selection.

b. Target Characteristics. The major characteristics of an aircraft that influence the maximum distance at which the aircraft can be visually detected are its size, color and exhaust smoke, speed and motion, altitude, and heading.

(1) *Size.* Visual detection range increases with an increase in target size. Apparent target size varies with the type of target and the aspect from which the aircraft is viewed. A jet fighter flying a course directly toward or away from an observer presents a small profile and can approach quite close to the observer before being detected. The same aircraft flying a crossing course presents a much larger profile to the observer and thus can be detected at much greater ranges.

(2) *Color and exhaust smoke.* The color of an aircraft influences detection range because color affects the degree with which the aircraft contrasts with the background against which it must be detected. An aircraft that contrasts with its background is visible at greater distances than one that is camouflaged to blend with its background. The contrast ratio of most aircraft is reduced when the aircraft is viewed against a mountain background. The background in the direction from which targets are expected to approach should be considered in selecting observer positions. Many jet aircraft leave a dark smoke trail that can be used as an aid in detection at long ranges.

(3) *Speed and motion.* Target speed also affects the range of visual detection of aircraft. In general, detection range decreases as target speed increases; however, motion, such as changing course, serves to enhance detection.

(4) *Altitude and heading.* Both the altitude and heading of aircraft influence visual detection range. Targets flying at altitudes between 150 and 1,200 feet are detected at longer ranges than targets flying either higher or lower. The heading of the aircraft affects the size of the profile presented to the observer and thereby affects detection range as explained in (1) above.

c. Environmental Characteristics. The major environmental characteristic that affects the range of visual detection of aircraft is meteorological visibility. Environmental elements, such as rain, snow, dust, fog, and haze, tend to reduce the range of visual detection of aircraft.

d. Observer Characteristics. The observer is the human link in the detection process, and his effectiveness will vary from moment to moment as a result of his personal motivation, state of training, and events taking place in his field of view that may distract his attention. These factors can be compensated for by assigning overlapping sectors of search to observers whenever possible. Two major factors must be considered in selecting personnel for duty as observers and in the assignment of observer sectors of search. These factors are the visual acuity required of observers and the size of the assigned search sector.

(1) *Visual acuity.* Observers are required to visually detect, recognize, and identify small objects at long range; therefore, observers are required to have good visual acuity. Visual acuity is man's capability to perceive an object based on minimum target size, shape, and contrast ratio. Binoculars have little effect in increasing detection ranges because they have narrow fields of view and consequently increase the time required to search a given area of space. However, binoculars may be helpful in identifying a target.

(2) *Search sector size.* In general, the range of visual aircraft detection increases with a decrease in the size of the search sector assigned an observer. Search sectors should be as small as possible, (but not less than 30°) and still provide good coverage to both sides of the expected avenues of target approach. Upon receiving an alert of the target approach, the search sector should be reduced and directed toward the direction of expected target approach.

(3) *Observer alertness.* Long periods of observer duty may degrade visual search performance. Observer duties should be rotated as often as possible. Warning of the expected approach of an aircraft tends to increase alertness of observers and can result in detection ranges considerably greater than in the case of unwarned observers.

4–5. Visual Search and Scan Procedures

The probability of visually detecting targets at long ranges is increased if systematic search procedures are followed by observer personnel. The procedure suggested here is called *scanning*. Two methods of scanning are suggested, one for use in flat terrain and the other for use in hilly terrain. In both methods, the observer should focus his eyes on a distant object, cloud, or terrain feature every few seconds so that his eyes remain focused for distant vision. If this is not done, his eyes will relax and distant objects will become blurred.

a. Flat Terrain. **To discern detail, an observer's eyes must stop and focus on an object. When moving the line of vision rapidly across flat terrain, the observer will see almost no detail. When an observer moves his line of vision in short steps from point to point, he is more likely to see detail. When observing over flat terrain, use the scanning technique illustrated in figure 4–1.**

b. Hilly Terrain. **When observing over hilly terrain, use the horizon as a starting point and scan as illustrated in figure 4–2. Use prominent terrain features as reference points to insure complete and systematic coverage of the assigned search sector. The observer should focus his eyes on the selected starting point and scan slowly across the search sector, using an up-and-down scanning technique. After a small portion of the sector has been scanned, the observer should refocus his eyes and then continue scanning across the search sector. The search must be systematic so that no area escapes inspection. The area between the horizon and the observer should also be searched to detect low-altitude aircraft between the observer and the mask.**

4–6. Search and Scan Duties

Alternating search and scan duty will reduce fatigue on both team members. One member searches for aircraft while the other member performs other team duties. Observers should not

Type of Literature: AIR DEFENSE - COMBAT

Primary User: UNIT COMMANDER
Information Objectives: WHAT IT IS - WHAT TO DO

No. of 1 Syll. words/Total No. words: 423/614=69%
FORCAST Reading Grade Level Score: 9.6

CHAPTER 4

TARGET ENGAGEMENT PROCEDURES

Section 1. GENERAL

4-1. Introduction

The successful engagement of targets by Redeye requires performing an ordered sequence of specific steps and the application of specific rules and criteria to each engagement. These steps require visual detection of the target, target identification, target acquisition (IR), sighting procedures, and conduct of fire. The order of accomplishment of the steps is usually as listed except that target identification may occur at any time, but must *always* occur before firing.

4-2. Scope

This chapter is divided into six sections with Sections II through VI each describing one of the five sequential steps of an engagement. Factors that influence the successful accomplishment of the five steps in the engagement sequence are also discussed.

Section II. DETECTING AERIAL TARGETS

4-3. Conditions Affecting Observers' Performance

How well a Redeye team performs depends on the team members and their training. However, even the best teams cannot give top performance if their sectors of search are too large or they are poorly located. Listed below are some general considerations that will help you review your plans for selecting and training observers, choosing observer sites, and assigning search sectors. Each of these general considerations is taken up in greater detail later in this chapter

a. *Selecting Observers.* An observer must spot, recognize, and identify at long range small targets of odd shapes, which blend into their background. To do this, he must be able to see very well. Though they may help him identify a target, binoculars will not help the observer search at greater ranges. They have small fields of vision, and it takes much longer to search the same area of space with them. Thus, you must choose men who see well without visual aids.

b. *Training Team Members to Rotate Observer Duties.* It is very hard to stay alert for long periods of duty as observer. Train the team members to switch off observer and gunner duties often. When you are warned of an expected attack, pass the warning on to your observers. They will then be more alert, and will spot the target sooner.

c. *Training Observers to Recognize Hard Versus Easy Conditions.* The observer has no control over the factors that make some targets harder to spot than others. However, it may help him to be aware of them.

(1) Targets that are easiest to spot:
  (a) fly a course across the sky in front of the observer. They have a large profile.
  (b) contrast with their background.
  (c) give off dark smoke trails.
  (d) fly slowly.
  (e) change course. This draws his attention to them.
  (f) fly at altitudes of 150 to 1,200 feet.
  (g) fly in clear weather, but do not come at him from out of the sun.

(2) Targets that are hardest to spot:
  (a) fly directly toward or away from the observer. They have a small profile.
  (b) are camouflaged to blend with their backgrounds.
  (c) fly fast.
  (d) fly below 150 feet or above 1,200 feet.
  (e) fly in snow, rain, dust, fog, or haze, or come at him from out of the sun.

d. *Choosing Observer Sites.* The site you pick for an observer will affect how far away he can spot targets. Mountains, hills, trees, and buildings may hide a low-flying target from the observer. This is called *terrain masking.* Choose a site where the terrain has a low profile so it will not mask targets.

The observer has to pick out an aircraft from the background it is flying against. He can see an aircraft that contrasts with its background better than one that is camouflaged to blend with the background. For example, most aircraft blend well with a background of mountains. When you pick an observer site, be sure to think about the background in the direction the targets will probably come from.

e. *Assigning Team Search Sectors.* In general, as the size of the search sector decreases, the range at which an observer can spot a target increases. Search sectors should be as small as possible, but not less than 30°. They must cover both sides of the route you expect targets to come by. When you are warned of an approaching target, reduce the size of the search sectors, and aim them in the direction you expect the targets to come from.

At times, sound or action in an observer's field of view may distract him. By assigning your men sectors of search that overlap, you increase the chance that they will spot a target.

A
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T
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R

Type of Literature: AIR DEFENSE - ADMINISTRATIVE

Rewrite Problem(s):

HARD WORDS	TOO WORDY
LONG SENTENCES	CONFUSING
NOT DIRECT	

No. of 1 Syll. words/Total No. words: 218/482=45%

FORCAST Reading Grade Level Score: 13.3

B
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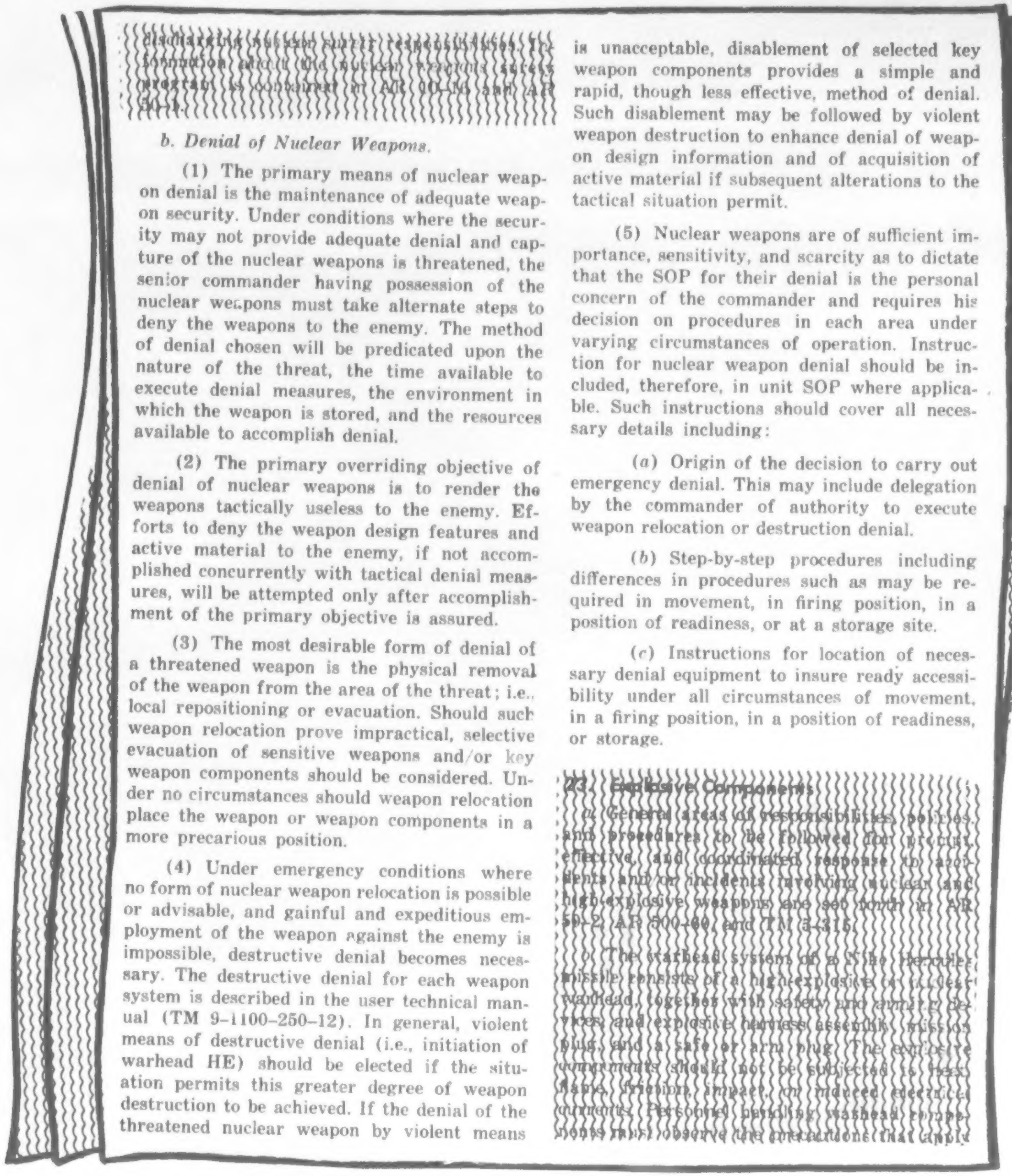
E



dismantling nuclear [illegible] responsibilities. Information about the nuclear weapons security program is contained in AR [illegible] and AR 50-1.

b. Denial of Nuclear Weapons.

(1) The primary means of nuclear weapon denial is the maintenance of adequate weapon security. Under conditions where the security may not provide adequate denial and capture of the nuclear weapons is threatened, the senior commander having possession of the nuclear weapons must take alternate steps to deny the weapons to the enemy. The method of denial chosen will be predicated upon the nature of the threat, the time available to execute denial measures, the environment in which the weapon is stored, and the resources available to accomplish denial.

(2) The primary overriding objective of denial of nuclear weapons is to render the weapons tactically useless to the enemy. Efforts to deny the weapon design features and active material to the enemy, if not accomplished concurrently with tactical denial measures, will be attempted only after accomplishment of the primary objective is assured.

(3) The most desirable form of denial of a threatened weapon is the physical removal of the weapon from the area of the threat; i.e., local repositioning or evacuation. Should such weapon relocation prove impractical, selective evacuation of sensitive weapons and/or key weapon components should be considered. Under no circumstances should weapon relocation place the weapon or weapon components in a more precarious position.

(4) Under emergency conditions where no form of nuclear weapon relocation is possible or advisable, and gainful and expeditious employment of the weapon against the enemy is impossible, destructive denial becomes necessary. The destructive denial for each weapon system is described in the user technical manual (TM 9-1100-250-12). In general, violent means of destructive denial (i.e., initiation of warhead HE) should be elected if the situation permits this greater degree of weapon destruction to be achieved. If the denial of the threatened nuclear weapon by violent means is unacceptable, disablement of selected key weapon components provides a simple and rapid, though less effective, method of denial. Such disablement may be followed by violent weapon destruction to enhance denial of weapon design information and of acquisition of active material if subsequent alterations to the tactical situation permit.

(5) Nuclear weapons are of sufficient importance, sensitivity, and scarcity as to dictate that the SOP for their denial is the personal concern of the commander and requires his decision on procedures in each area under varying circumstances of operation. Instruction for nuclear weapon denial should be included, therefore, in unit SOP where applicable. Such instructions should cover all necessary details including:

(*a*) Origin of the decision to carry out emergency denial. This may include delegation by the commander of authority to execute weapon relocation or destruction denial.

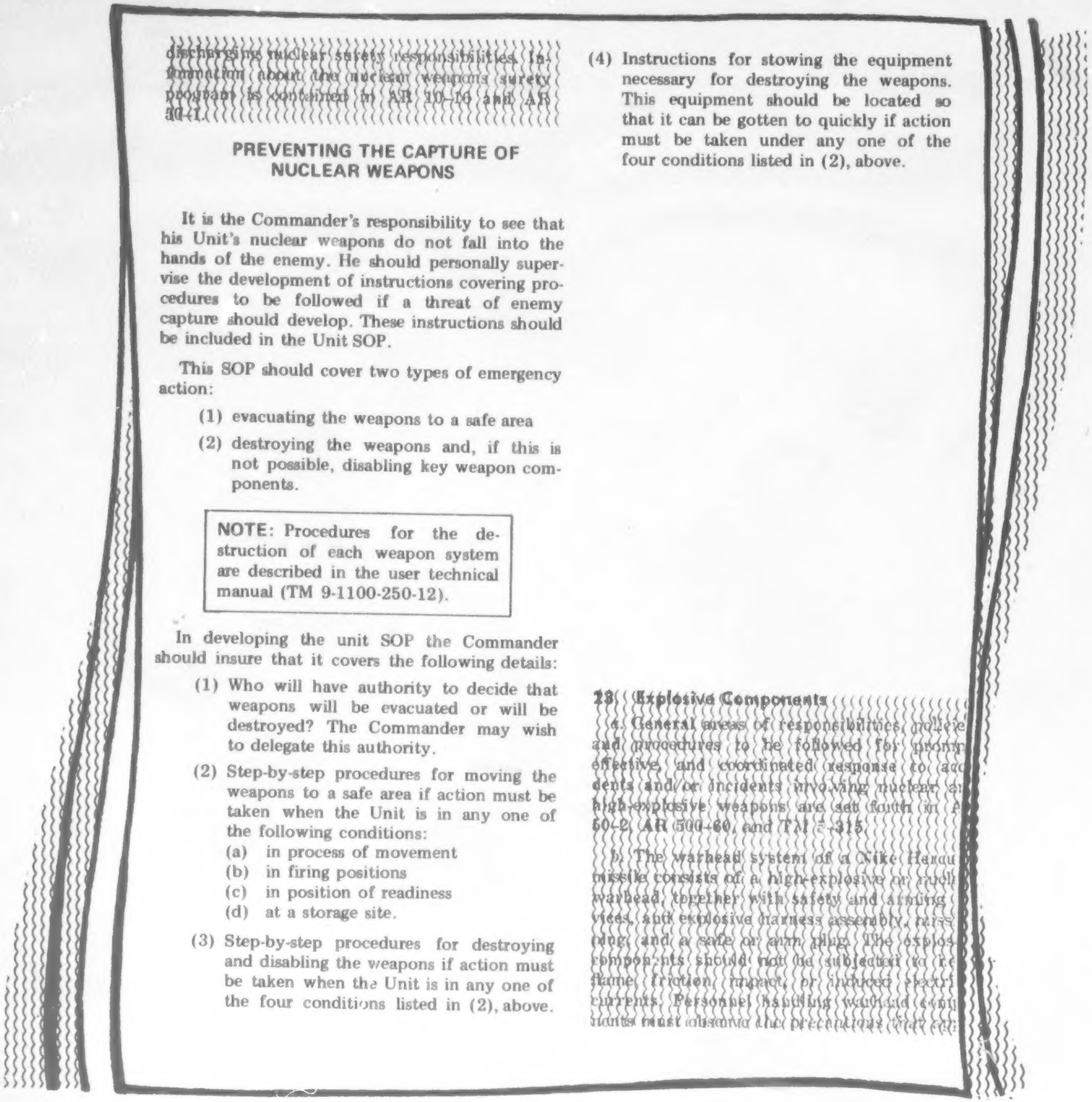
(*b*) Step-by-step procedures including differences in procedures such as may be required in movement, or in firing position, in a position of readiness, or at a storage site.

(*c*) Instructions for location of necessary denial equipment to insure ready accessibility under all circumstances of movement, in a firing position, in a position of readiness, or storage.

23. Explosive Components

a. General areas of responsibilities, policies, and procedures to be followed for prompt, effective, and coordinated response to accidents and/or incidents involving nuclear and high-explosive weapons are set forth in AR 50-2, AR 500-60, and TM 5-315.

b. The warhead system of a Nike Hercules missile consists of a high-explosive or nuclear warhead, together with safety and arming devices and explosive harness assembly, mission plug, and a safe or arm plug. The explosive components should not be subjected to heat, flame, friction, impact, or induced electrical currents. Personnel handling warhead components must observe the precautions that apply



discharging nuclear surety responsibilities. Information about the nuclear weapons surety program is contained in AR 10-16 and AR 50-1.

PREVENTING THE CAPTURE OF NUCLEAR WEAPONS

It is the Commander's responsibility to see that his Unit's nuclear weapons do not fall into the hands of the enemy. He should personally supervise the development of instructions covering procedures to be followed if a threat of enemy capture should develop. These instructions should be included in the Unit SOP.

This SOP should cover two types of emergency action:

(1) evacuating the weapons to a safe area
(2) destroying the weapons and, if this is not possible, disabling key weapon components.

NOTE: Procedures for the destruction of each weapon system are described in the user technical manual (TM 9-1100-250-12).

In developing the unit SOP the Commander should insure that it covers the following details:

(1) Who will have authority to decide that weapons will be evacuated or will be destroyed? The Commander may wish to delegate this authority.
(2) Step-by-step procedures for moving the weapons to a safe area if action must be taken when the Unit is in any one of the following conditions:
    (a) in process of movement
    (b) in firing positions
    (c) in position of readiness
    (d) at a storage site.
(3) Step-by-step procedures for destroying and disabling the weapons if action must be taken when the Unit is in any one of the four conditions listed in (2), above.
(4) Instructions for stowing the equipment necessary for destroying the weapons. This equipment should be located so that it can be gotten to quickly if action must be taken under any one of the four conditions listed in (2), above.

23. Explosive Components

a. General areas of responsibilities, polic
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missile consists of a high-explosive or nucle
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Type of Literature: AIR DEFENSE - ADMINISTRATIVE

Primary User: UNIT COMMANDER
Information Objectives: WHAT TO DO

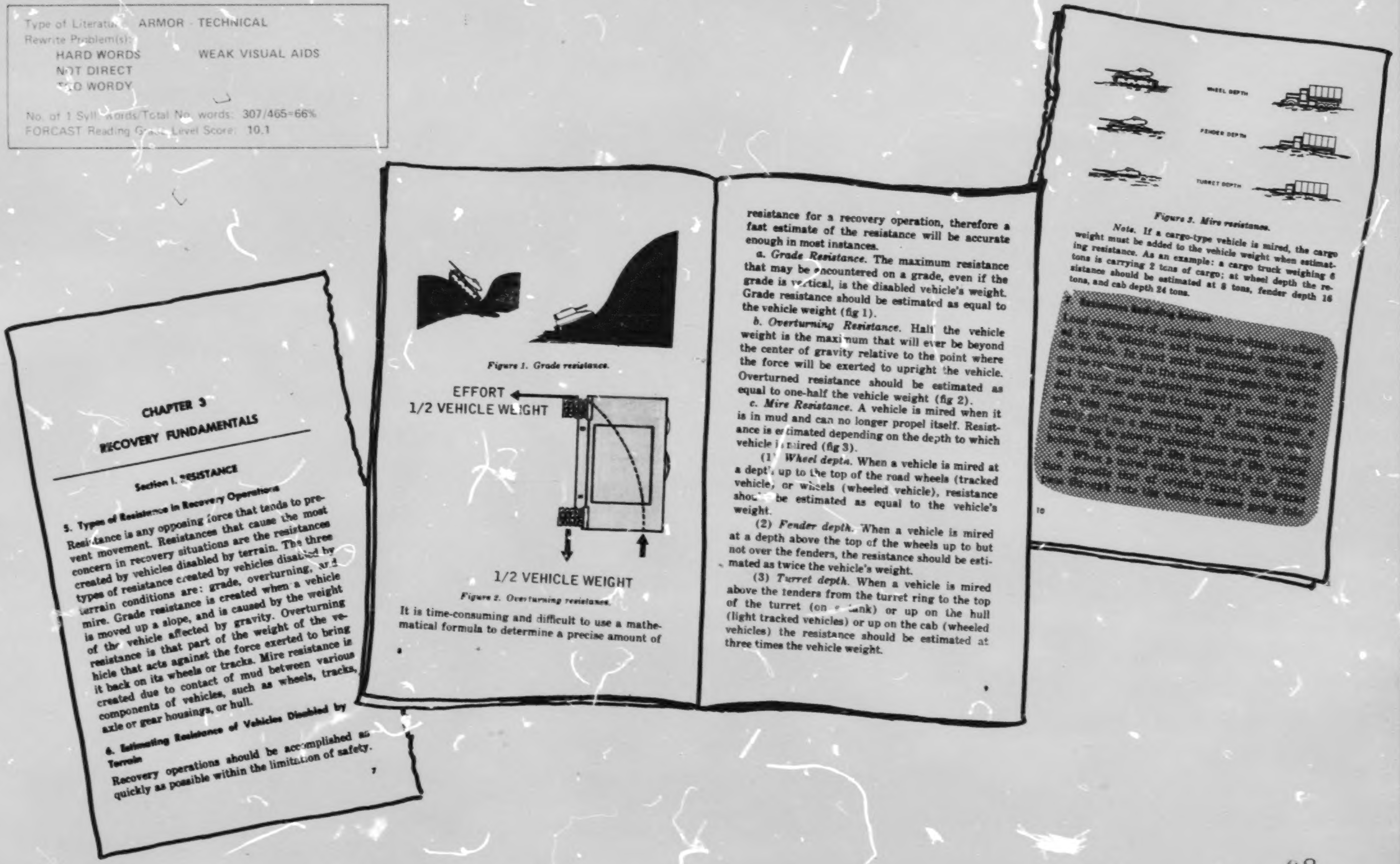
No. of 1 Syll. words/Total No. words: 139/250=56%
FORCAST Reading Grade Level Score: 11.6

A F T E R

Type of Literature: ARMOR - TECHNICAL
Rewrite Problem(s):
HARD WORDS WEAK VISUAL AIDS
NOT DIRECT
TOO WORDY

No. of 1 Syll. words/Total No. words: 307/465=66%
FORCAST Reading Grade Level Score: 10.1

BEFORE



CHAPTER 3

RECOVERY FUNDAMENTALS

Section I. RESISTANCE

5. Types of Resistance in Recovery Operations

Resistance is any opposing force that tends to prevent movement. Resistances that cause the most concern in recovery situations are the resistances created by vehicles disabled by terrain. The three types of resistance created by vehicles disabled by terrain conditions are: grade, overturning, and mire. Grade resistance is created when a vehicle is moved up a slope, and is caused by the weight of the vehicle affected by gravity. Overturning resistance is that part of the weight of the vehicle that acts against the force exerted to bring it back on its wheels or tracks. Mire resistance is created due to contact of mud between various components of vehicles, such as wheels, tracks, axle or gear housings, or hull.

6. Estimating Resistance of Vehicles Disabled by Terrain

Recovery operations should be accomplished as quickly as possible within the limitation of safety.

7

Figure 1. Grade resistance.

Figure 2. Overturning resistance.

It is time-consuming and difficult to use a mathematical formula to determine a precise amount of resistance for a recovery operation, therefore a fast estimate of the resistance will be accurate enough in most instances.

a. Grade Resistance. The maximum resistance that may be encountered on a grade, even if the grade is vertical, is the disabled vehicle's weight. Grade resistance should be estimated as equal to the vehicle weight (fig 1).

b. Overturning Resistance. Half the vehicle weight is the maximum that will ever be beyond the center of gravity relative to the point where the force will be exerted to upright the vehicle. Overturned resistance should be estimated as equal to one-half the vehicle weight (fig 2).

c. Mire Resistance. A vehicle is mired when it is in mud and can no longer propel itself. Resistance is estimated depending on the depth to which vehicle is mired (fig 3).

(1) *Wheel depth.* When a vehicle is mired at a depth up to the top of the road wheels (tracked vehicle) or wheels (wheeled vehicle), resistance should be estimated as equal to the vehicle's weight.

(2) *Fender depth.* When a vehicle is mired at a depth above the top of the wheels up to but not over the fenders, the resistance should be estimated as twice the vehicle's weight.

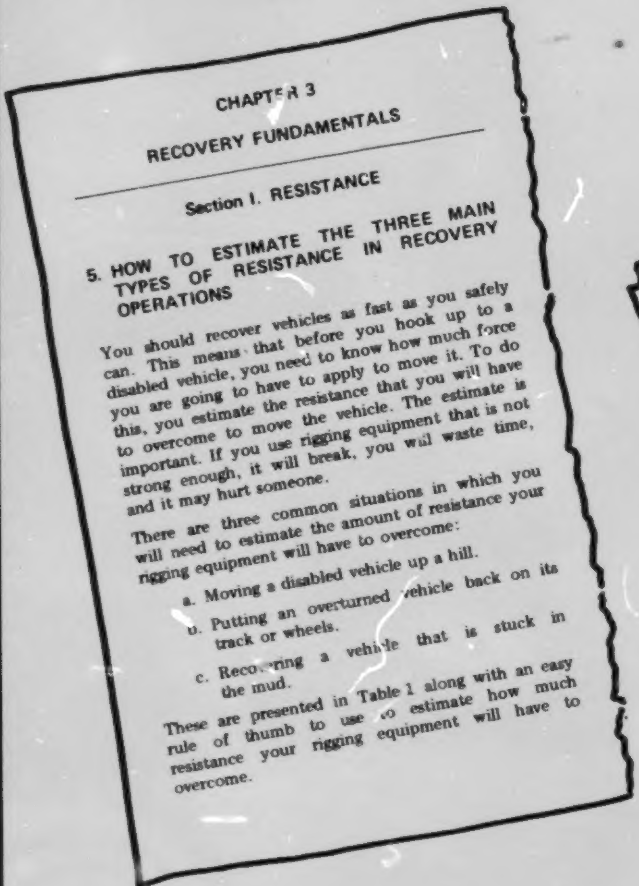
(3) *Turret depth.* When a vehicle is mired above the fenders from the turret ring to the top of the turret (on a tank) or up on the hull (light tracked vehicles) or up on the cab (wheeled vehicles) the resistance should be estimated at three times the vehicle weight.

Figure 3. Mire resistance.

Note. If a cargo-type vehicle is mired, the cargo weight must be added to the vehicle weight when estimating resistance. As an example: a cargo truck weighing 6 tons is carrying 2 tons of cargo; at wheel depth the resistance should be estimated at 8 tons, fender depth 16 tons, and cab depth 24 tons.

7. [illegible]

10



CHAPTER 3

RECOVERY FUNDAMENTALS

Section I. RESISTANCE

5. HOW TO ESTIMATE THE THREE MAIN TYPES OF RESISTANCE IN RECOVERY OPERATIONS

You should recover vehicles as fast as you safely can. This means that before you hook up to a disabled vehicle, you need to know how much force you are going to have to apply to move it. To do this, you estimate the resistance that you will have to overcome to move the vehicle. The estimate is important. If you use rigging equipment that is not strong enough, it will break, you will waste time, and it may hurt someone.

There are three common situations in which you will need to estimate the amount of resistance your rigging equipment will have to overcome:

a. Moving a disabled vehicle up a hill.

b. Putting an overturned vehicle back on its track or wheels.

c. Recovering a vehicle that is stuck in the mud.

These are presented in Table 1 along with an easy rule of thumb to use to estimate how much resistance your rigging equipment will have to overcome.

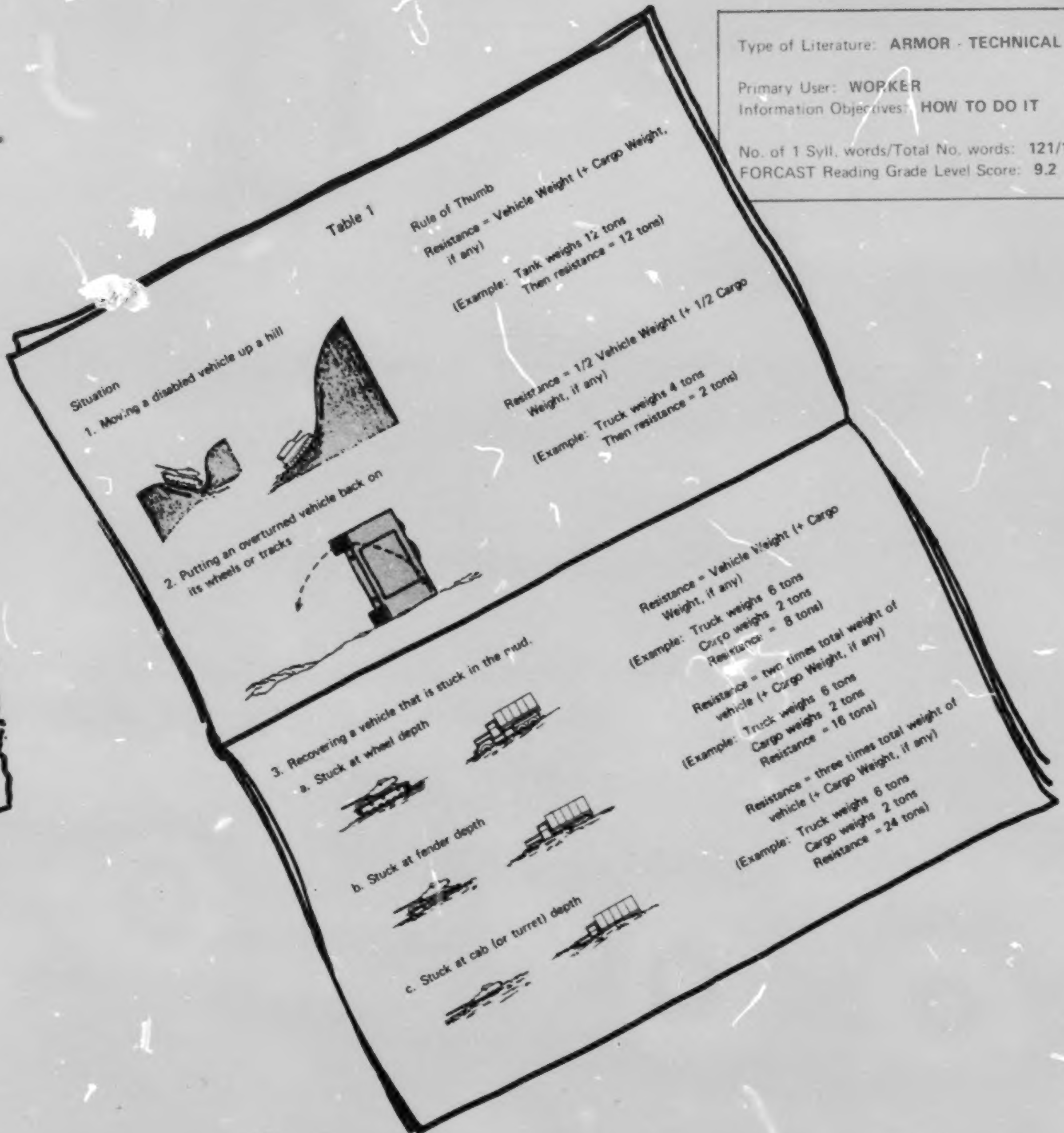


Table 1

Situation	Rule of Thumb
1. Moving a disabled vehicle up a hill	Resistance = Vehicle Weight (+ Cargo Weight, if any) (Example: Tank weighs 12 tons Then resistance = 12 tons) Resistance = 1/2 Vehicle Weight (+ 1/2 Cargo Weight, if any) (Example: Truck weighs 4 tons Then resistance = 2 tons)
2. Putting an overturned vehicle back on its wheels or tracks	Resistance = Vehicle Weight (+ Cargo Weight, if any) (Example: Truck weighs 6 tons Cargo weighs 2 tons Resistance = 8 tons)
3. Recovering a vehicle that is stuck in the mud.	
a. Stuck at wheel depth	Resistance = two times total weight of vehicle (+ Cargo Weight, if any) (Example: Truck weighs 6 tons Cargo weighs 2 tons Resistance = 16 tons)
b. Stuck at fender depth	Resistance = three times total weight of vehicle (+ Cargo Weight, if any) (Example: Truck weighs 6 tons Cargo weighs 2 tons Resistance = 24 tons)
c. Stuck at cab (or turret) depth	

Type of Literature: **ARMOR - TECHNICAL**

Primary User: **WORKER**
Information Objectives: **HOW TO DO IT**

No. of 1 Syll. words/Total No. words: **121/169=72%**
FORCAST Reading Grade Level Score: **9.2**

AFTER

Type of Literature: ARMOR - TECHNICAL
Rewrite Problem(s):
HARD WORDS
RUN-TOGETHER FORMAT

No. of 1 Syll. words/Total No. words: 196/378=52%
FORCAST Reading Grade Level Score: 12.4

[illegible]
[illegible] screws (1)
[illegible] tighten 14 [illegible]
[illegible] Access to carrier
steps c through g above to install
[illegible] assembly.

BEFORE

Section VII. MAINTENANCE OF AIR CLEANER

3-34. General

Maintenance services performed by the operator and crew on the air cleaner consist of cleaning the air cleaner element. Newer type air cleaner assemblies are provided with elements that are fitted to lock into position within their containers. Otherwise, maintenance instructions are similar for all elements. See figures 3-9 and 3-10 for differences between new and old type air cleaners.

CAUTION

Operation with a dirty or improper air cleaner element can cause severe engine damage due to overheating or abrasive action. Make sure element is clean, properly installed, and matches air cleaner assembly (fig. 3-9 and 3-10).

3-35. Air Cleaner

(fig. 3-9 and 3-10)

a. General. The air cleaner element can be cleaned by one of three methods, listed in *c* through *e* below in preferred-use sequence. The method used depends upon the length of time the carrier can be shut down and the availability of equipment and supplies.

b. Removing Air Cleaner Element

(1) Unfasten four clamps securing element container to air cleaner head. While unfastening clamps, hold container so it does not drop.

(2) Remove container, then remove element.

c. Cleaning Element with Compressed Air. Direct 100 psi of compressed air against inside of element, then against fins on outside of element, and again against inside of element.

CAUTION

To avoid damage to element, do not hold air nozzle against element.

d. Cleaning Element with Water.

(1) Wash element in soap and water, and rinse thoroughly.

(2) Dry element thoroughly before reinstalling in container.

e. Cleaning Element by Jarring. Gently tap with hands on sides of fins so dirt will fall from element.

NOTE

Do not strike ends of element.

f. Installing Air Cleaner Element.

CAUTION

Two types of non-interchangeable air cleaner elements and containers may be used on carriers. When servicing air cleaner element, make certain element being installed is same type as one removed from container.

(1) Place new type element in air cleaner container with slots in bottom baffle of element located over stops in container housing. Rotate element to lock into position.

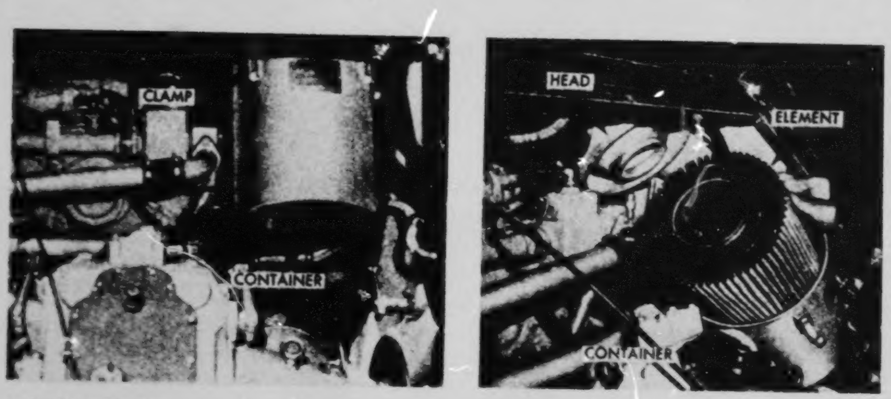
NOTE

If carrier is equipped with older type air cleaner assembly, either end of element can go into container first.

NOTE

The new air cleaner was incorporated beginning with M113A1-MSJ10501, M577A1-PSJ00001, M106A1-QSJ10001, M125A1-RSJ00001, and XM806E1 (same as M113A1).

(2) Position container on cleaner head, and fasten four clamps.

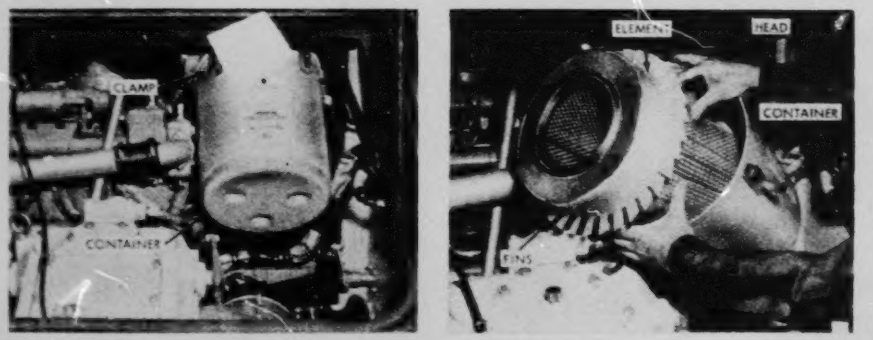


A. Container clamps.

B. Element.

ORD E58498

Figure 3-9. Servicing old type air cleaner (M113A1)—common.



A—CONTAINER CLAMPS

B—ELEMENT

AT 25926

Figure 3-10. Servicing new type air cleaner (M113A1)—common.

3-34. Cleaning the Air Cleaner Element

Cleaning the air cleaner element is part of the job of the driver and the carrier crew. If you use a dirty or wrong model air cleaner element you can damage your engine. You must be sure the element is clean, put in the right way, and is the right model.

There are two types of air cleaner assemblies: old and new. The new type has a cleaner element that locks into place in its container. Be *sure* you use the right kind of element for your carrier. Figures 3-9 and 3-10 show you the differences between the old and new cleaners.

3-35. Removing and Cleaning the Element

1. *Take out air cleaner element*
   a. Undo the four clamps that hold the container to the air cleaner head. Be sure to hold the container so it does not fall.
   b. Take off the container.
   c. Take out the element.
2. *Clean air cleaner element.* The three ways to do this are listed below. The first one (a) is the best for you to use. The second one (b) is next best, and the third one (c) is last choice.
   a. *clean with compressed air*
      (1) Aim 100 psi of compressed air on the inside of the element.
      (2) Aim it on the fins on the outside of the element.
      (3) Aim it again on the inside of the element.

NOTE: DO NOT HOLD AIR NOZZLE AGAINST ELEMENT

   b. *clean with water*
      (1) Wash with element in soap and water.
      (2) Rinse it off.
      (3) Dry it.
   c. *clean by jarring*
      (1) Tap gently with your hands on the sides of the fins, so all dirt will fall out.

NOTE: DO NOT STRIKE ENDS OF ELEMENT

3. *Put air cleaner element back in place.*

CAUTION: Make certain the element you put back is the same type as the one you took out. The new type element belongs to models beginning with:
M113A1-MSJ10501
M577A1-PSJ00001
M106A1-QSJ10001
M125A1-RSJ00001
and XM806E1 (same as M113A1).

   a. Place the element in the air cleaner assembly.

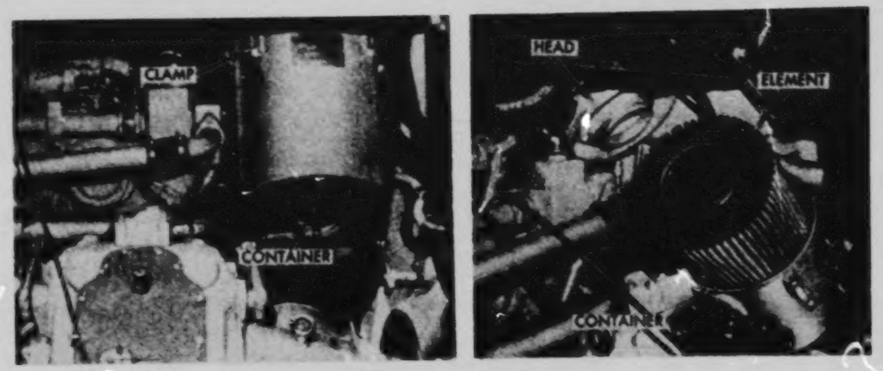
Note: For new type elements:
Be sure the slots in the bottom baffle of the element are over the stops of the container housing.
Rotate element to lock into position.
For old type elements:
Either end of old type elements can go into container first.

   b. Place the container on the cleaner head.
   c. Fasten the four clamps on the head.

Type of Literature: ARMOR - TECHNICAL

Primary User: WORKER
Information Objectives: HOW TO DO IT

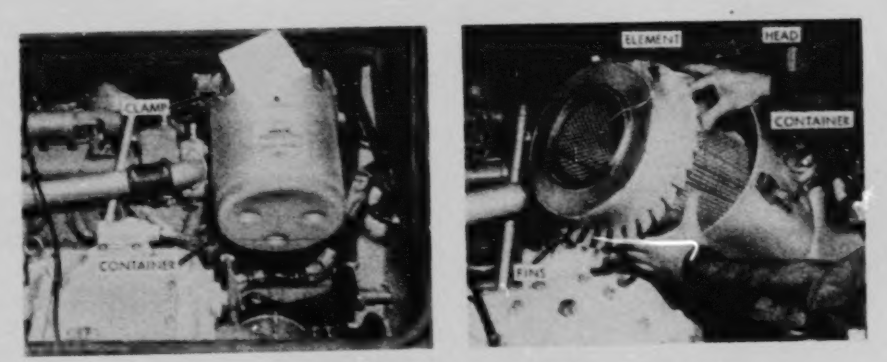
No. of 1 Syll. words/Total No. words: 281/384=73%
FORCAST Reading Grade Level Score: 9.0



A. Container clamps.

B. Element

Figure 3-9. Servicing old type air cleaner (M113A1)—common.



A–CONTAINER CLAMPS

B–ELEMENT

Figure 3-10. Servicing new type air cleaner (M113A1)—common.

AFTER

Type of Literature: ARMOR - COMBAT
Rewrite Problem(s):
NOT DIRECT
TOO VAGUE
RUN-TOGETHER FORMAT

No. of 1 Syll. words/Total No. words: 126/213=60%
FORCAST Reading Grade Level Score: 11.0

B
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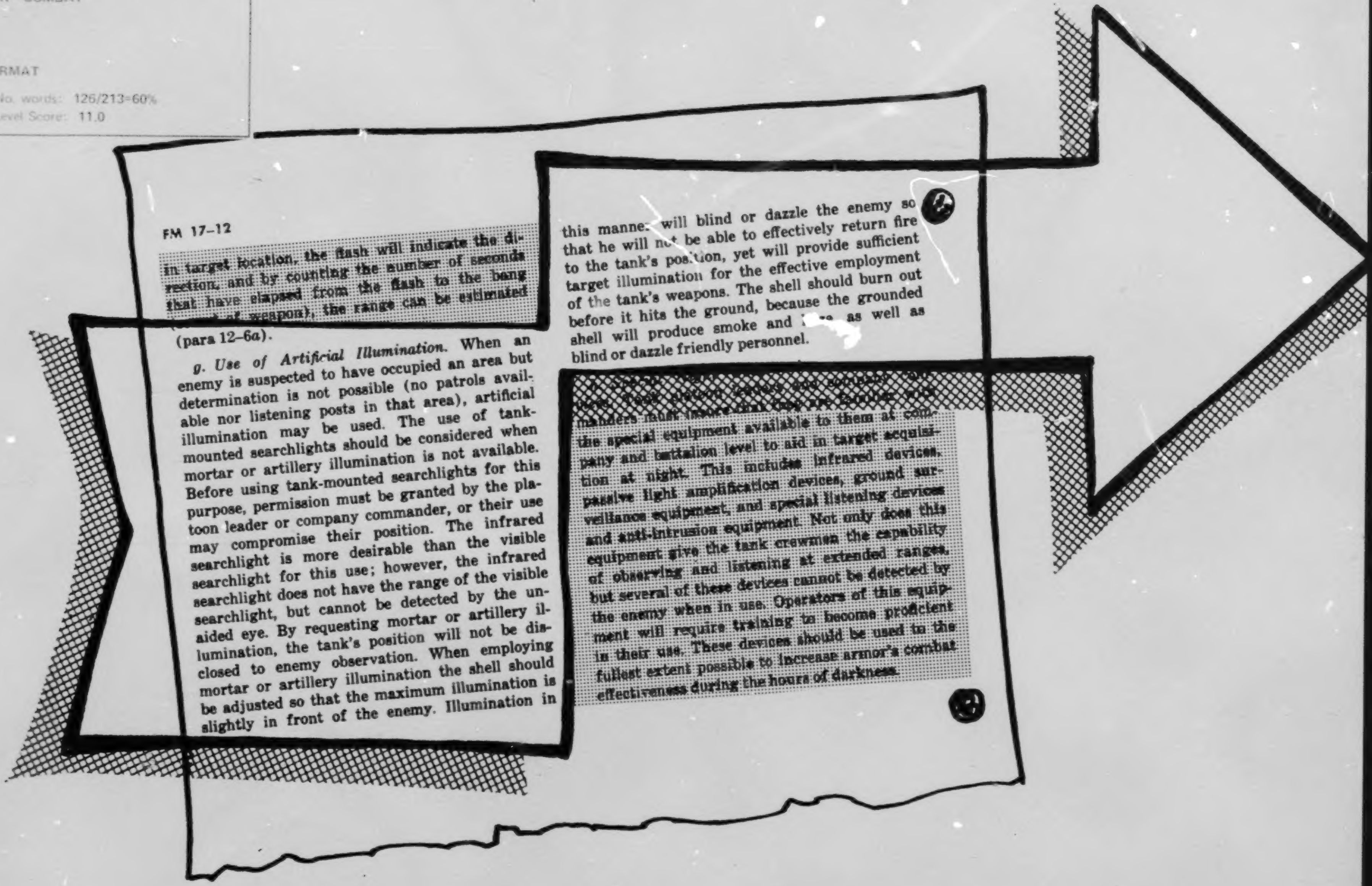


FM 17–12

in target location, the flash will indicate the di-
rection, and by counting the number of seconds
that have elapsed from the flash to the bang
[illegible] weapon), the range can be estimated
(para 12–6*a*).

g. Use of Artificial Illumination. When an
enemy is suspected to have occupied an area but
determination is not possible (no patrols avail-
able nor listening posts in that area), artificial
illumination may be used. The use of tank-
mounted searchlights should be considered when
mortar or artillery illumination is not available.
Before using tank-mounted searchlights for this
purpose, permission must be granted by the pla-
toon leader or company commander, or their use
may compromise their position. The infrared
searchlight is more desirable than the visible
searchlight for this use; however, the infrared
searchlight does not have the range of the visible
searchlight, but cannot be detected by the un-
aided eye. By requesting mortar or artillery il-
lumination, the tank's position will not be dis-
closed to enemy observation. When employing
mortar or artillery illumination the shell should
be adjusted so that the maximum illumination is
slightly in front of the enemy. Illumination in
this manner will blind or dazzle the enemy so
that he will not be able to effectively return fire
to the tank's position, yet will provide sufficient
target illumination for the effective employment
of the tank's weapons. The shell should burn out
before it hits the ground, because the grounded
shell will produce smoke and [illegible] as well as
blind or dazzle friendly personnel.

[illegible]
[illegible]
manders must insure [illegible]
the special equipment available to them at com-
pany and battalion level to aid in target acquisi-
tion at night. This includes infrared devices,
passive light amplification devices, ground sur-
veillance equipment, and special listening devices
and anti-intrusion equipment. Not only does this
equipment give the tank crewmen the capability
of observing and listening at extended ranges,
but several of these devices cannot be detected by
the enemy when in use. Operators of this equip-
ment will require training to become proficient
in their use. These devices should be used to the
fullest extent possible to increase armor's combat
effectiveness during the hours of darkness.

in target location, the flash will indicate the direction, and by counting the number of seconds that have elapsed from the flash to the bang (sound of weapon), the range can be estimated (para 12–6a).

g. *Using artificial light to find the enemy.*

PROBLEM: You think the enemy may have moved into your area. It is dark though, and you are not sure.

Usually this would be checked out by sending a patrol out to scout the area or by getting a report from listening posts in that area. But suppose a patrol cannot be sent out and there are no listening posts in that area. You need another way to check-out the area. This is when you may want some way of lighting-up the area so you can see if there are signs of the enemy.

There are three different ways you can use artificial light to check-out the area. The first two ways give you a good chance of finding the enemy without giving away your position. The third way, using tank-mounted searchlights, will give away the position of the tank.

(1) USING THE INFRARED SEARCHLIGHT: This is a good way to check-out an area for signs of the enemy because the infrared light will not be visible to him unless he has special detecting equipment. The main problem you might have is that the area you want to check-out is too far away for the infrared searchlight to be of any help. It does not have the range that the visible beam searchlight has.

(2) CALLING FOR MORTAR OR ARTILLERY ILLUMINATING ROUNDS: Since these are not being fired from your position they are a good way to light-up an area you want to check-out without giving away your position. The way you adjust fire for these rounds is important though:

Adjust fire so the shells give off the most light just in front of the enemy. This will blind him and when you open fire from your tank it will make it difficult for him to spot your location.
Adjust fire so the illuminating round burns out before it hits the ground. If it is still burning when it hits the ground it will make smoke and haze that will make it hard for you to see the enemy.

(3) USING TANK-MOUNTED SEARCHLIGHTS: These will light-up the area but the enemy can easily see them. You must get an OK from your Platoon Leader or Company Commander before you use these searchlights.

h. *Special Night Observation/Listening Devices.* Tank platoon leaders and company commanders must insure that they are familiar with the special equipment available to them at company and battalion level to aid in target acquisition at night. This includes infrared devices, passive light amplification devices, ground surveillance equipment, and special listening devices and anti-intrusion equipment. Not only does this equipment give the tank crewmen the capability of observing and listening at extended ranges, but several of these devices cannot be detected by the enemy when in use. Operators of this equipment will require training to become proficient in their use. These devices should be used to the fullest extent possible to increase armor's combat effectiveness during the hours of darkness.

Type of Literature: **ARMOR - COMBAT**

Primary User: **DIRECT SUPERVISOR**
Information Objectives: **WHAT TO DO**

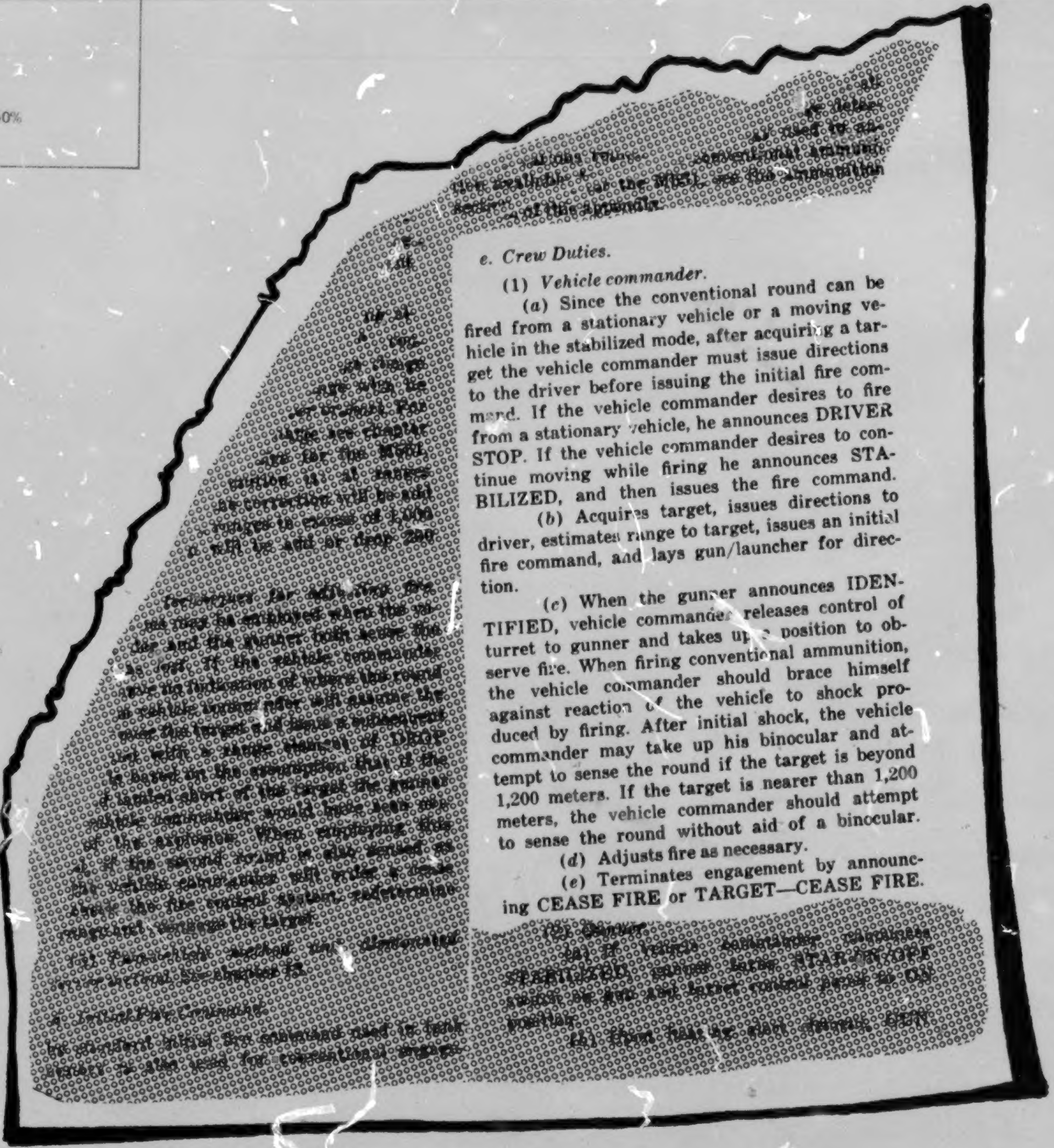
No. of 1 Syll. words/Total No. words: **276/377=73%**
FORCAST Reading Grade Level Score: **9.0**

AFTER

Type of Literature: ARMOR - COMBAT
Rewrite Problem(s):
HARD WORDS
LONG SENTENCES

No. of 1 Syll. words/Total No. words: 99/197=50%
FORCAST Reading Grade Level Score: 12.5

B E F O R E



e. Crew Duties.

(1) *Vehicle commander.*

(*a*) Since the conventional round can be fired from a stationary vehicle or a moving vehicle in the stabilized mode, after acquiring a target the vehicle commander must issue directions to the driver before issuing the initial fire command. If the vehicle commander desires to fire from a stationary vehicle, he announces DRIVER STOP. If the vehicle commander desires to continue moving while firing he announces STABILIZED, and then issues the fire command.

(*b*) Acquires target, issues directions to driver, estimates range to target, issues an initial fire command, and lays gun/launcher for direction.

(*c*) When the gunner announces IDENTIFIED, vehicle commander releases control of turret to gunner and takes up a position to observe fire. When firing conventional ammunition, the vehicle commander should brace himself against reaction of the vehicle to shock produced by firing. After initial shock, the vehicle commander may take up his binocular and attempt to sense the round if the target is beyond 1,200 meters. If the target is nearer than 1,200 meters, the vehicle commander should attempt to sense the round without aid of a binocular.

(*d*) Adjusts fire as necessary.

(*e*) Terminates engagement by announcing CEASE FIRE or TARGET—CEASE FIRE.

Type of Literature: ARMOR – COMBAT

Primary User: DIRECT SUPERVISOR
Information Objectives: WHAT TO DO

No. of 1 Syll. words/Total No. words: 105/151=70%
FORCAST Reading Grade Level Score: 9.5

(M551 ARMORED RECONNAISSANCE/AIRBORNE ASSAULT VEHICLE, AR/AAV)

e. CREW DUTIES DURING TARGET ENGAGEMENT

- (1) Duties of the vehicle commander
  - (a) The vehicle commander picks a target.
  - (b) He decides whether to fire with the vehicle moving or stopped. If he wants to fire while the vehicle is stopped, he says DRIVER STOP. If he wants to fire while the vehicle is moving, he says STABILIZED.
  - (c) He estimates the range to the target, and gives a fire command. Then he lays the gun/launcher for direction.
  - (d) When the gunner says IDENTIFIED, the vehicle commander gives control of the turret to him.
  - (e) The vehicle commander gets in place to watch the fire. He must brace himself against the shock that firing makes in the vehicle. After the shock, he tries to sense the round. He may use his binoculars if the target is more than 1200 meters away.
  - (f) He adjusts fire as needed.
  - (g) He says CEASE FIRE or TARGET-CEASE FIRE to end the firing.

AFTER

Type of Literature: ARMOR - COMBAT
Rewrite Problem(s):
HARD WORDS RUN-TOGETHER FORMAT
LONG SENTENCES
CONFUSING
No. of 1 Syll. words/Total No. words: 404/591=68%
FORCAST Reading Grade Level Score: 9.8

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Section II.

PREPARATION FOR AND REOCCUPATION OF NIGHT FIRING POSITIONS

14-5. General

After the range card for a tank's firing position has been completed (para 14–2 through 14–4), the position of the tank is marked to facilitate reoccupation during periods of poor visibility, or to permit a relieving unit to use the prepared range cards. Depending upon the terrain and tactical situation either of the following methods may be used.

14–6. Method 1

a. Preparation of Position. After the tank range card is completed, two reference stakes, with filtered or shielded lights, are placed out as shown in figure 14–5. One stake (high enough to be visible to the driver) is placed at the center, and touching the bow of the tank. The second stake is positioned approximately 20 to 25 meters to the front, and on line with, the first stake and the center of the vehicle. The gunner then lays on the far reference stake and records deflection reading on the range card.

b. Reoccupation of Position. When the firing position is to be reoccupied during darkness, or periods of poor visibility, the shielded lights on the reference stakes are turned on. As the tank moves into position, the driver, with the aid of a strip of white tape or chalk mark on the front center of the tank hull, aligns the tank on the two lights. He stops when the front slope of the tank touches and is centered on the near reference stake and the two stakes are in line. The gunner then lays his direct-fire sight on the far reference light and, using the resetter knob on his azimuth indicator, indexes the deflection reading for the far reference stake. The tank is now positioned so that the range card data can be used to engage targets.

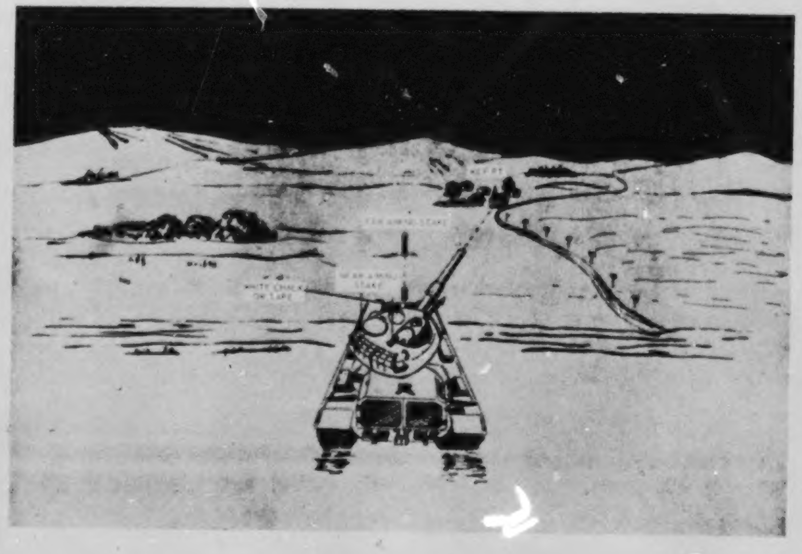

Figure 14–5. Method 1.

14–7. Method 2

a. Preparation of Position. After the tank range card is completed, two stakes are driven into the ground immediately adjacent to the outside edge of the left or right track. These stakes must be located at the point where the track leaves the ground. Aiming stakes, with filtered or shielded lights, are positioned in line at any angle from the firing position except within 100 mils of the direct front or rear of the tank. (Placement of the aiming stakes in such a position will not permit accurate repositioning.) One stake is placed approximately 30 to 50 meters from the firing position. The gunner traverses the turrret and aligns the aiming cross of the periscope on that aiming stake. The second aiming stake is placed in line with the first stake, midway between the first stake and the tank. When both aiming stakes are positioned so that they appear in line through the periscope, the gunner records the deflection reading.

b. Reoccupation of Position. When the firing position is to be reoccupied, white tape is stretched between the two ground stakes to facilitate alignment of the tank's right or left track. With the shielded lights on the aiming stakes turned on, the gun is traversed to the angle of the aiming stakes and the tank is moved forward adjacent to the tape (fig 14–6). The gunner controls the final positioning of the tank by observing through his sight until the far light appears to be above and in line with the near light at which time the tank is halted. The gunner then, using the resetter knob on the azimuth indicator, indexes the prerecorded deflection to the aiming stakes. The tank is now positioned so that the range card data can be used to engage targets.

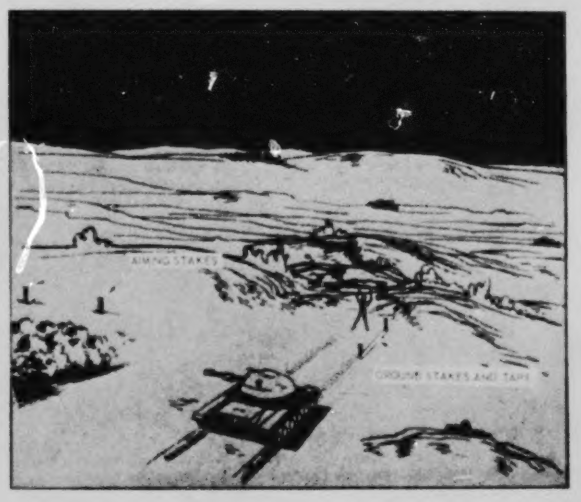

Figure 14–6. Method 2.

Type of Literature: ARMOR - COMBAT

Primary User: WORKER
Information Objectives: HOW TO DO IT

No. of 1 Syll. words/Total No. words: 471/611=77%
FORCAST Reading Grade Level Score: 8.5

Section II. PREPARING FIRING POSITIONS FOR USE AT NIGHT

14.5 PURPOSE OF MARKING TANK POSITION

After the crew has completed the range card for a tank's firing position, they mark the position of the tank. Their own tank or a relief unit can now move into that position after dark or when there is low visibility. The crew can use the range card that was prepared in daylight to fire on targets in the dark.

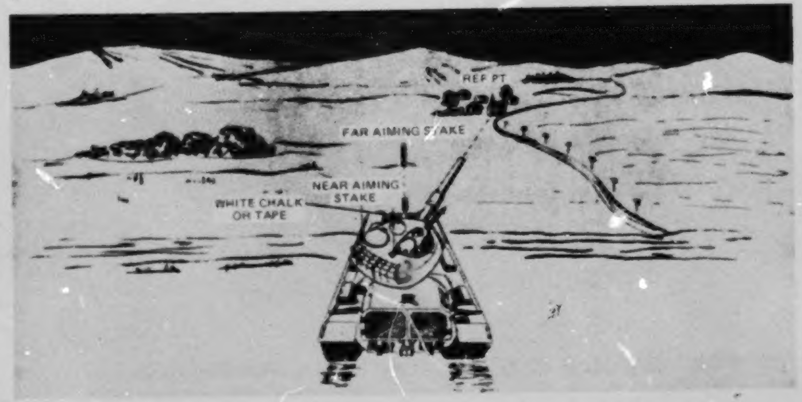

Figure 14—5. Method 1.

14.6 METHOD 1

a. *How to Mark the Position*

(1) Complete the range card.

(2) Crewmen place two reference stakes which have screened or filtered lights. (See Figure 14-5.)

(a) A crewman places STAKE ONE at the center of the tank, touching the bow. He makes sure the stake is high enough that the driver can see it.

(b) A crewman places STAKE TWO 20 to 25 meters in front of the tank, on a line with stake one and the center of the tank.

(3) The gunner then lays on the far reference stake and records the deflection reading on the range card.

b. *How to Move Into a Marked Position*

(1) Turn on the screened lights on the reference stakes.

(2) The driver lines up the tank with the two lighted stakes.

(a) He uses a strip of white tape or chalk mark on the front center of the tank hull to help him sight on the stakes.

(b) He is in place when the white tape or chalk mark and the two stakes are in line, and the front slope of the tank touches the first stake.

(3) The gunner indexes the deflection reading for the far reference stake.

(a) He lays his direct-fire sight on the far reference light.

(b) He uses the resetter knob on his azimuth indicator to index the deflection.

(4) The tank is now in position to use the range card data.

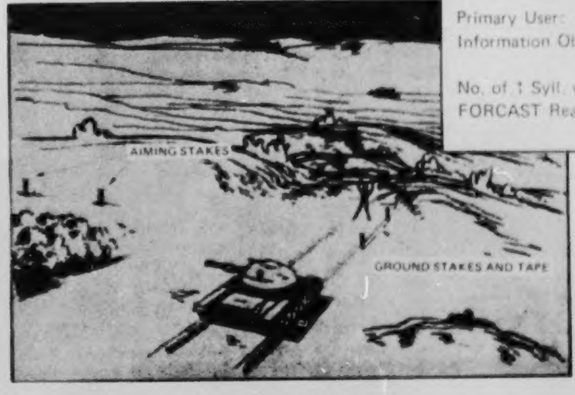

Figure 14—6. Method 2.

14.7 METHOD 2

a. *How to Mark the Position*

(1) Complete the range card.

(2) Crewmen place two ground stakes. (See Figure 14-6.)

(a) Stakes can be placed on either the right side or the left side of the tank.

(b) Place one stake next to the outside edge of the track near the rear of the tank. The stake must be at the point where the track leaves the ground.

(c) Place the second stake at the outside edge of the track near the front of the tank. This stake must also be at the point where the track leaves the ground.

(3) Crewmen place the first aiming stake, which has a filtered or screened light.

(a) They place it 30 to 50 meters from the firing position.

(b) The stake can be at any angle from the firing position except within 100 mils of the direct front or rear of the tank.

(4) The gunner moves the turret to the left or right to line up the aiming cross of the periscope with the aiming stake.

(5) Crewmen place the second aiming stake.

(a) They place it in line with the first aiming stake and the tank, half way between the stake and the tank.

(b) The two stakes should appear in line through the periscope.

(6) The gunner records the deflection reading.

b. *How to Move Into a Marked Position*

(1) Crewmen stretch white tape between the two ground stakes to help position the tank's track.

(2) They turn on the lights on the two aiming stakes.

(3) The gunner moves the turret to the angle of the aiming stakes.

(4) The driver moves the tank up next to the tape.

(5) The driver stops the tank when the gunner sees the far light above the near light, and in line with it.

(6) The gunner uses the resetter knob on the azimuth indicator to index the prerecorded deflection to the lighted aiming stakes.

(7) The tank is now in position to use the range card data.

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E
R**

Type of Literature: ARMOR - COMBAT
Rewrite Problem(s):
HARD WORDS
RUN-TOGETHER FORMAT
TOO WORDY
REMOTE REFERENCES

No. of 1 Syll. words/Total No. words: 448/733=61%
FORCAST Reading Grade Level Score: 10.8

BEFORE

31. Problems You Will Face

There are certain areas that are always a consideration in driving. They do not fall within any specific classification but cannot be ignored.

a. Mines are a hazard to vehicle operation. They are easily and quickly laid by the enemy and are very effective for putting armored vehicles out of action. They do not necessarily destroy the vehicle but they can immobilize it by blowing off tracks or parts of the suspension system. Minefields may be found in many places, but the most likely are areas where a natural avenue of approach exists. Exercise caution when such places must be traversed. Likely spots for minefields are:

(1) Approaches to bridges.
(2) Fords.
(3) Bypasses around blown bridges.
(4) Surrounding roadblocks.
(5) Shoulders of narrow roads.
(6) In front of enemy positions.
(7) Sites that would make good bivouac areas.
(8) Around any fortified area.

b. When you are supporting an advance by infantry, drive in low range. This will keep you from running away from the foot troops and will also keep your engine at the proper operating temperature (fig. 40).

c. Do not attempt to crash through roadblocks or barriers (fig. 41). Your vehicle is probably capable of doing this but such obstacles are usually mined. Likely routes around the barrier in all probability will be mined; therefore, take extreme caution in selecting a bypass route.

d. In case of a nuclear attack, stay in your vehicle. Other than deep, underground cover, the best protection against radiation is the hull of an armored vehicle. Get away from ground zero of the weapon and up wind from it, if possible. Your organization is provided with meters that will indicate the density of radiation; each individual will have a direct reading dosimeter, which will tell him the total accumulation to which he has been subjected. After you get out of the area of high radiation intensity, you should take the necessary steps to decontaminate your vehicle as indicated in paragraph 20. Persons in armored vehicles are also capable of crossing contaminated areas that are denied to foot troops. This is a decided advantage that the armor vehicle crew have in nuclear warfare.

e. Several tracked vehicles are air transportable. Tracked vehicles are usually moved long distances by being transported rather than by proceeding under their own power. Instructions for loading vehicles on aircraft are provided in the technical manuals of the 10–500 series. Rail movement is probably used most. In continental United States, the Association of American Railroads has a standard loading plan that specifies the minimum lashing and blocking for each type vehicle. Since there are different maximum requirements among the different rail lines, the nearest agent will have been consulted for particulars when vehicles are to be loaded on railroad cars. Each unit usually becomes responsible for loading its own vehicles—it is necessary that you learn how your vehicle must be loaded. The technical manual for each type vehicle gives the minimum requirements of the Army for loading and lashing the vehicle. These requirements usually closely parallel those of the railroad lines. If you are familiar with the requirements in the technical manual it will be very easy to adapt to any additional requirements of the rail line.

f. In all positions it is imperative that you camouflage to prevent detection. Camouflage may be of two kinds—you may hide your vehicle by placing it in defilade and using concealment overhead or you may make the vehicle appear to be something it is not. In an arctic area you may paint the vehicle white and pile snow around it to break the shadow, or you may build an igloo shaped cover for it. In the first instance you have made the vehicle look like an ordinary snow drift; in the second, you have hidden it. Foliage can be used to conceal vehicles (fig. 42). When you are selecting material, pick foliage that matches the surroundings. If you were trying to conceal your vehicle in the edge of a forest that contained mostly oak trees, you would use oak boughs to hide it. The material used should be changed as soon as it begins to wilt and show a different background. Nets or other type concealment can be used to hide the vehicle. In mobile defense, a defilade position behind a small rise in the ground will take much less time than digging a vehicle position and will serve the same purpose.

Figure 39. Keep the front of the vehicle toward the primary enemy threat.

Figure 41. Do not crash barriers.

Figure 41. Stay with the infantry.

Figure 42. Tank concealed by foliage.

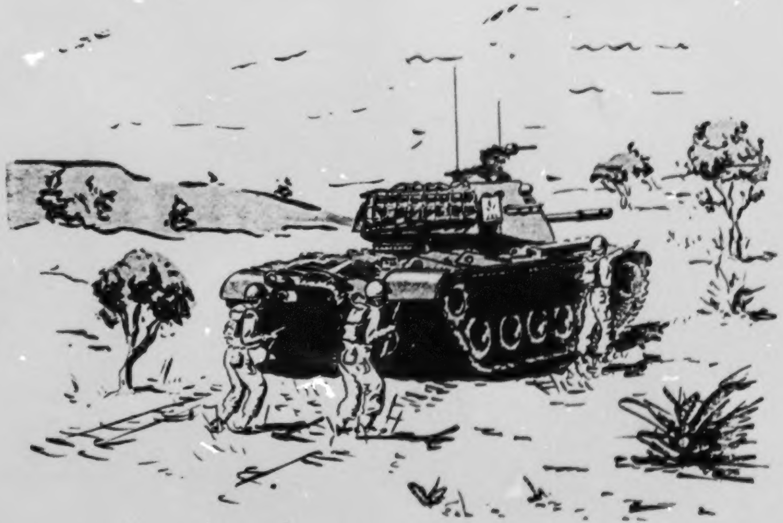


Figure 41. Stay with the infantry.

31. PROBLEMS YOU WILL FACE

When you drive in combat, you must at all time keep in mind some special considerations.

a. *Mines.* At all times be on the lookout for possible mines. Take special care at these spots:

(1) An approach to a bridge.
(2) A ford.
(3) Any route that bypasses a bridge that has been blown.
(4) The area around a roadblock.
(5) The shoulder of a narrow road.
(6) The ground in front of enemy positions.
(7) Any spot that would make a good bivouac area.
(8) The ground around a fortified area.

b. *Supporting infantry.* When you support an advance by infantry, stay with the foot troops. Drive in low range so that you do not run away from them. See Figure 41.

c. *Barriers.* Do not crash through roadblocks or barriers. Do not use the most likely bypass routes. Be careful of mines in the area.

d. *Nuclear attack.* In case of a nuclear attack, stay in your vehicle. Its hull is one of the best protections against radiation. After the blast, stay away from ground zero. If you can, go upwind from ground zero. This will get you away from the fall-out radiation. Your organization will have meters to check the level of radiation, and you will have a dosimeter which will tell you the total amount of radiation that you have been exposed to. When you get to a safe place, decontaminate your vehicle. As paragraph 20 tells you, you can get much of the radiation off it if you sweep or wash the vehicle.

Type of Literature: ARMOR - COMBAT

Primary User: WORKER
Information Objectives: WHAT TO DO

No. of 1 Syll. words/Total No. words: 286/394=73%
FORCAST Reading Grade Level Score: 9.0

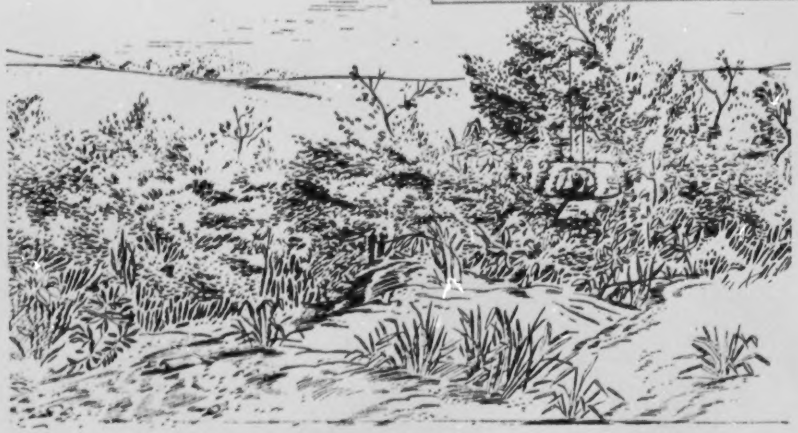


Figure 42. Tank concealed by foliage.

e. *Moving long distances.* Tracked vehicles are not usually driven long distances. Instead, they are moved by rail or by air. Each unit loads its own vehicles, so you need to know how to load your vehicle and tie it down. You will find this information in the technical manual for your vehicle. Learn it. If you need to, you can add to this basic information the requirements of the railroad line or of the particular type of aircraft.

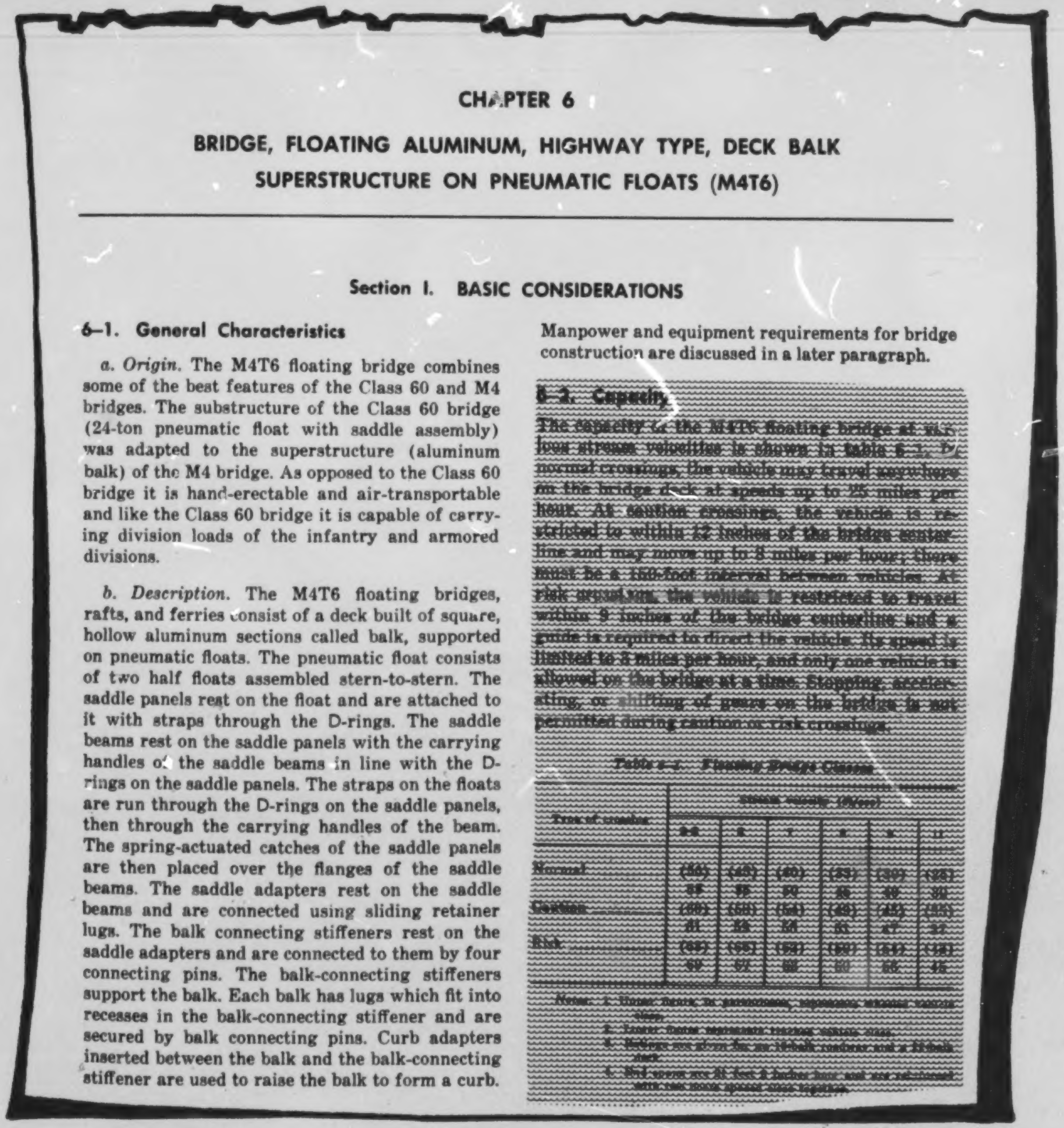
f. *Camouflage.* When your vehicle is stopped in any position, you must camouflage it so that the enemy will not detect it. You can hide it or you can make it look like something it is not. For example, you could hide it behind a hill or in foliage or cover it with nets or tree branches. Figure 42 shows a tank that is hidden in foliage.

AFTER

Type of Literature: ENGINEER - TECHNICAL
Rewrite Problem(s):
TOO VAGUE
WEAK VISUAL AIDS
RUN-TOGETHER FORMAT

No. of 1 Syll. words/Total No. words: 176/279=63%
FORCAST Reading Grade Level Score: 10.5

BEFORE



CHAPTER 6

BRIDGE, FLOATING ALUMINUM, HIGHWAY TYPE, DECK BALK SUPERSTRUCTURE ON PNEUMATIC FLOATS (M4T6)

Section I. BASIC CONSIDERATIONS

6–1. General Characteristics

a. Origin. The M4T6 floating bridge combines some of the best features of the Class 60 and M4 bridges. The substructure of the Class 60 bridge (24-ton pneumatic float with saddle assembly) was adapted to the superstructure (aluminum balk) of the M4 bridge. As opposed to the Class 60 bridge it is hand-erectable and air-transportable and like the Class 60 bridge it is capable of carrying division loads of the infantry and armored divisions.

b. Description. The M4T6 floating bridges, rafts, and ferries consist of a deck built of square, hollow aluminum sections called balk, supported on pneumatic floats. The pneumatic float consists of two half floats assembled stern-to-stern. The saddle panels rest on the float and are attached to it with straps through the D-rings. The saddle beams rest on the saddle panels with the carrying handles of the saddle beams in line with the D-rings on the saddle panels. The straps on the floats are run through the D-rings on the saddle panels, then through the carrying handles of the beam. The spring-actuated catches of the saddle panels are then placed over the flanges of the saddle beams. The saddle adapters rest on the saddle beams and are connected using sliding retainer lugs. The balk connecting stiffeners rest on the saddle adapters and are connected to them by four connecting pins. The balk-connecting stiffeners support the balk. Each balk has lugs which fit into recesses in the balk-connecting stiffener and are secured by balk connecting pins. Curb adapters inserted between the balk and the balk-connecting stiffener are used to raise the balk to form a curb. Manpower and equipment requirements for bridge construction are discussed in a later paragraph.

6–2. Capacity

The capacity of the M4T6 floating bridge at various stream velocities is shown in table 6–1. At normal crossings, the vehicle may travel anywhere on the bridge deck at speeds up to 25 miles per hour. At caution crossings, the vehicle is restricted to within 12 inches of the bridge centerline and may move up to 8 miles per hour; there must be a 150-foot interval between vehicles. At risk crossings, the vehicle is restricted to travel within 9 inches of the bridge centerline and a guide is required to direct the vehicle. Its speed is limited to 3 miles per hour, and only one vehicle is allowed on the bridge at a time. Stopping, accelerating, or shifting of gears on the bridge is not permitted during caution or risk crossings.

Table 6–1. Floating Bridge Classes

Type of crossing	Stream velocity (ft/sec)					
	[illegible]	[illegible]	7	[illegible]	[illegible]	11
Normal	(50) 55	(45) 55	(40) 50	(33) 45	(30) 40	(25) 30
Caution	(60) 61	(58) 58	(54) 58	(48) 51	(42) 47	(35) 37
Risk	(65) 69	(65) 67	(62) 66	(60) 60	(54) 58	(42) 45

Notes: 1. Upper figure, in parentheses, represents tracked vehicle class.
2. Lower figure represents wheeled vehicle class.
3. [illegible]
4. [illegible]

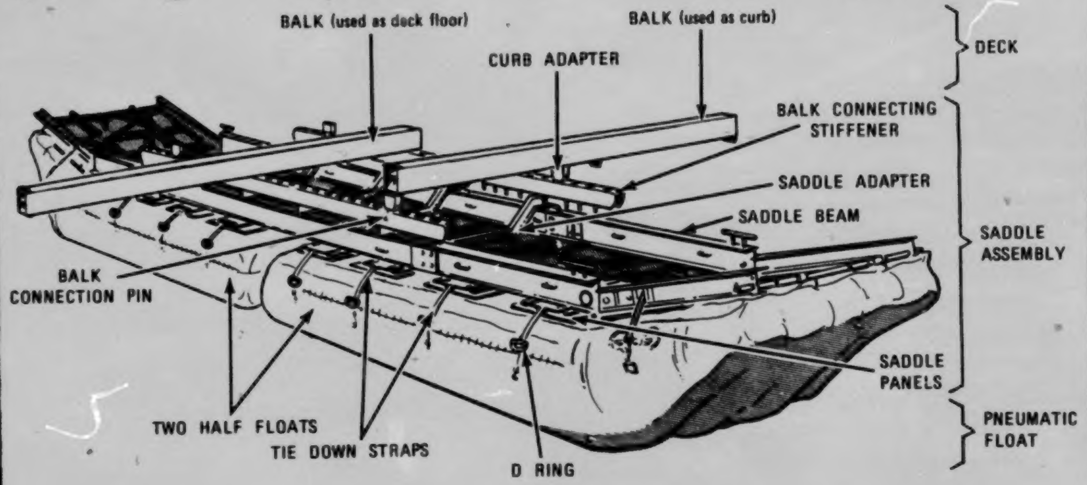


Figure 6-1. Main parts of M4T6 floating bridge: the 24-ton float and saddle assembly with two balk in place.

6-1. GENERAL CHARACTERISTICS

a. *Main Features.* The M4T6 bridge brings together in one bridge the heavy load capacity of the Class 60 bridge with the light weight deck of the M4 bridge. This means that the M4T6 bridge can carry the same infantry or armored division loads that the Class 60 bridge can carry. The light deck of the M4T6 bridge makes it lighter and easier to handle than the Class 60 bridge. The M4T6 can be set up by hand and moved by air; the Class 60 bridge can not.

b. *Description.* The M4T6 floating bridge is made up of three main parts: (1) the deck, (2) the saddle assembly, which joins the deck to the float, and (3) the pneumatic floats which support the bridge in the water (see Fig. 6-1).

(1) The bridge is put together by first joining two half floats to make the longer float shown in Figure 6-1.

(2) Next the four parts of the saddle assembly are put together on the float:

(a) First, the saddle panels are laid across the floats and tied in place with straps to the D-rings.

(b) The saddle beams are then laid in place on the saddle panels and strapped in place.

(c) The saddle adapters are then set on the saddle beams and are connected to the beams with retainer lugs.

(d) The last part of the saddle assembly is the balk connecting stiffeners. These stiffeners are set on the saddle adapters and are fastened to them

(3) The deck is laid in place last. It is made up of square, hollow aluminum sections called balk. The balk are laid across the float with each end of the talk resting on a balk connecting stiffener. The ends are fastened to the balk connecting stiffeners with talk connecting pins.

The balk on each outside edge of the deck roadway are raised to form a curb. These balk are raised above the rest of the deck and held in place by parts called curb adapters.

Type of Literature: ENGINEER - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT IT IS - WHAT IT LOOKS LIKE

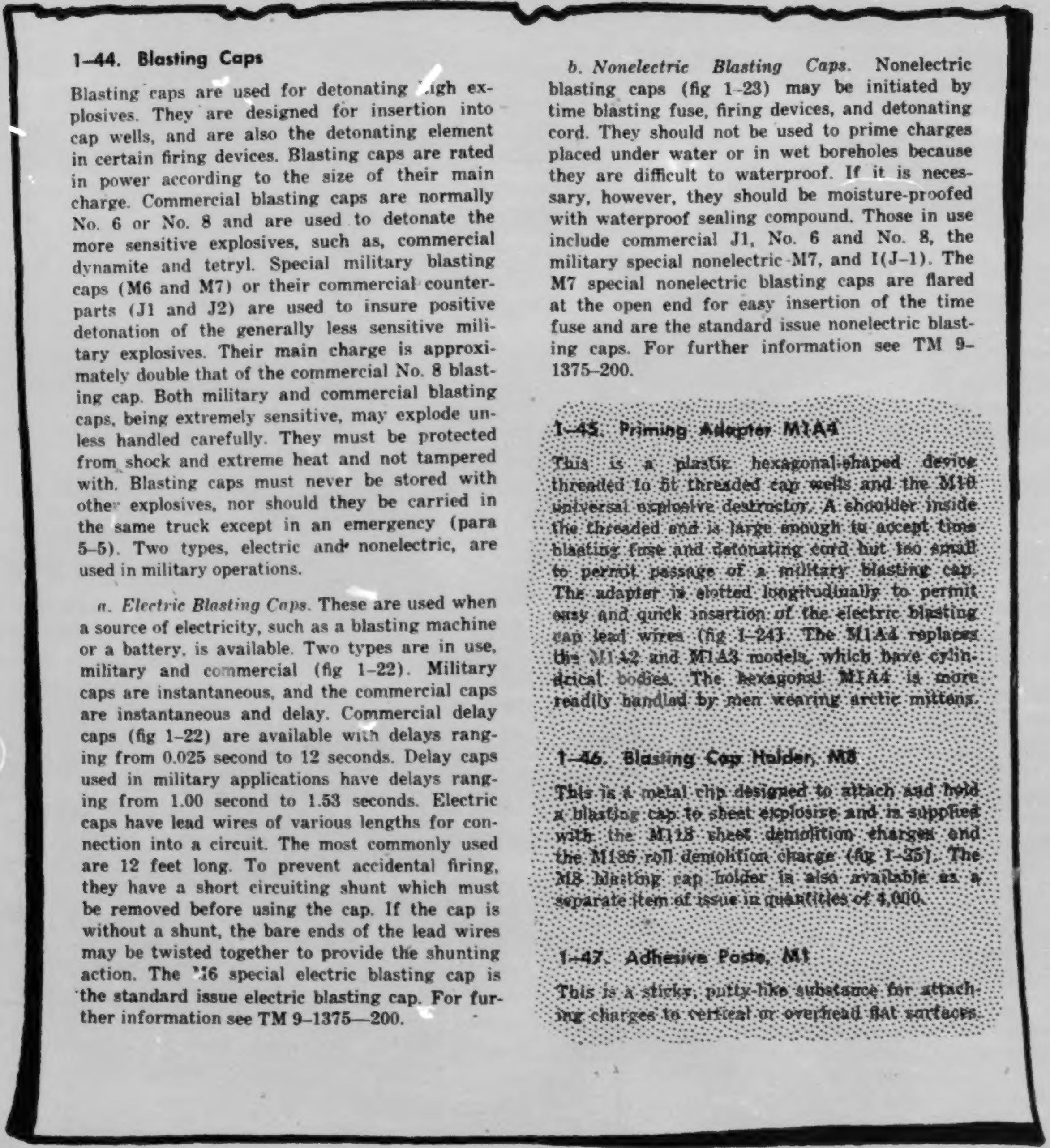
No. of 1 Syll. words/Total No. words: 248/322=77%
FORCAST Reading Grade Level Score: 8.4

AFTER

Type of Literature: ENGINEERS - TECHNICAL
Rewrite Problem(s):
HARD WORDS   REMOTE REFERENCES
TOO WORDY
CONFUSING

No. of 1 Syll. words/Total No. words: 237/425=56%
FORCAST Reading Grade Level Score: 11.6

B
E
F
O
R
E



1–44. Blasting Caps

Blasting caps are used for detonating high explosives. They are designed for insertion into cap wells, and are also the detonating element in certain firing devices. Blasting caps are rated in power according to the size of their main charge. Commercial blasting caps are normally No. 6 or No. 8 and are used to detonate the more sensitive explosives, such as, commercial dynamite and tetryl. Special military blasting caps (M6 and M7) or their commercial counterparts (J1 and J2) are used to insure positive detonation of the generally less sensitive military explosives. Their main charge is approximately double that of the commercial No. 8 blasting cap. Both military and commercial blasting caps, being extremely sensitive, may explode unless handled carefully. They must be protected from shock and extreme heat and not tampered with. Blasting caps must never be stored with other explosives, nor should they be carried in the same truck except in an emergency (para 5–5). Two types, electric and nonelectric, are used in military operations.

a. Electric Blasting Caps. These are used when a source of electricity, such as a blasting machine or a battery, is available. Two types are in use, military and commercial (fig 1–22). Military caps are instantaneous, and the commercial caps are instantaneous and delay. Commercial delay caps (fig 1–22) are available with delays ranging from 0.025 second to 12 seconds. Delay caps used in military applications have delays ranging from 1.00 second to 1.53 seconds. Electric caps have lead wires of various lengths for connection into a circuit. The most commonly used are 12 feet long. To prevent accidental firing, they have a short circuiting shunt which must be removed before using the cap. If the cap is without a shunt, the bare ends of the lead wires may be twisted together to provide the shunting action. The M6 special electric blasting cap is the standard issue electric blasting cap. For further information see TM 9–1375—200.

b. Nonelectric Blasting Caps. Nonelectric blasting caps (fig 1–23) may be initiated by time blasting fuse, firing devices, and detonating cord. They should not be used to prime charges placed under water or in wet boreholes because they are difficult to waterproof. If it is necessary, however, they should be moisture-proofed with waterproof sealing compound. Those in use include commercial J1, No. 6 and No. 8, the military special nonelectric M7, and I(J–1). The M7 special nonelectric blasting caps are flared at the open end for easy insertion of the time fuse and are the standard issue nonelectric blasting caps. For further information see TM 9–1375–200.

1–45. Priming Adapter M1A4

This is a plastic hexagonal-shaped device threaded to fit threaded cap wells and the M10 universal explosive destructor. A shoulder inside the threaded end is large enough to accept time blasting fuse and detonating cord but too small to permit passage of a military blasting cap. The adapter is slotted longitudinally to permit easy and quick insertion of the electric blasting cap lead wires (fig 1–24). The M1A4 replaces the M1A2 and M1A3 models, which have cylindrical bodies. The hexagonal M1A4 is more readily handled by men wearing arctic mittens.

1–46. Blasting Cap Holder, M8

This is a metal clip designed to attach and hold a blasting cap to sheet explosive and is supplied with the M118 sheet demolition charges and the M186 roll demolition charge (fig 1–25). The M8 blasting cap holder is also available as a separate item of issue in quantities of 4,000.

1–47. Adhesive Paste, M1

This is a sticky, putty-like substance for attaching charges to vertical or overhead flat surfaces.

1-44. BLASTING CAPS

WARNING: You must be very careful with blasting caps. Keep them from extreme heat and shock. Never store them with other explosives. Do not tamper with them. They may explode if handled carelessly.

You will use both military and commercial blasting caps to set off high explosives and some kinds of firing devices. Blasting caps are rated in power by the size of their main charge. Use commercial No. 6 or No. 8 caps for explosives that are easy to set off such as commercial dynamite and tetryl. Military explosives are generally harder to set off than commercial explosives. For military explosives use military M6 or M7 caps (commercial versions are the J1 or J2). The main charge of the M6 and M7 caps has about twice the power of the No. 8 caps used to set off commercial dynamite and tetryl.

Both military and commercial caps come in electric and nonelectric form.

a. *Electric blasting caps.* Use these caps when you have a source of electricity to set them off. They usually have 12 foot lead wires for you to connect to a circuit. They may also have a short circuiting shunt to keep the cap from going off by accident. If there is no shunt, twist the bare ends of the lead wires together to make one. You must take the shunt off before you use the cap.

All military caps fire with no delay. You can get commercial caps that fire with no delay, and those that fire with a delay. When you use delay caps, the delay will be from 1.00 to 1.53 seconds. You will usually use the M6 special electric blasting cap.

b. *Nonelectric blasting caps.* Use a time blasting fuse, firing device or detonating cord to set off nonelectric blasting caps. Do not let these caps get wet. If you have to use them where they might get wet, waterproof them with a sealing compound. You will usually use the M7 special nonelectric blasting cap. See TM 9-1375-200 for more information on blasting caps.

1-45. Priming Adapter M1A4

This is a plastic hexagonal-shaped device threaded to fit threaded cap wells and the M10 universal explosive destructor. A shoulder inside the threaded end is large enough to accept time blasting fuse and detonating cord but too small to permit passage of a military blasting cap. The adapter is slotted longitudinally to permit easy and quick insertion of the electric blasting cap lead wires (fig 1-24). The M1A4 replaces the M1A2 and M1A3 models, which have cylindrical bodies. The hexagonal M1A4 is more readily handled by men wearing arctic mittens.

1-46. Blasting Cap Holder, M8

This is a metal clip designed to attach and hold a blasting cap to sheet explosive and is supplied with the M118 sheet demolition charges and the M186 roll demolition charge (fig 1-25). The M8 blasting cap holder is also available as a separate item of issue in quantities of 4,000.

1-47. Adhesive Paste, M1

This is a sticky, putty-like substance for attaching charges to vertical or overhead flat surfaces. It is useful in holding charges while tying them in place or, under some conditions, for holding without tying. It will not adhere satisfactorily to dirty, dusty, wet or oily surfaces, and becomes stiff and hard and loses its adhesiveness at subzero temperatures. It is softened by water and becomes useless if wet.

Type of Literature: ENGINEERS - TECHNICAL

Primary User: WORKER
Information Objectives: HOW IT'S USED - WHEN TO USE IT

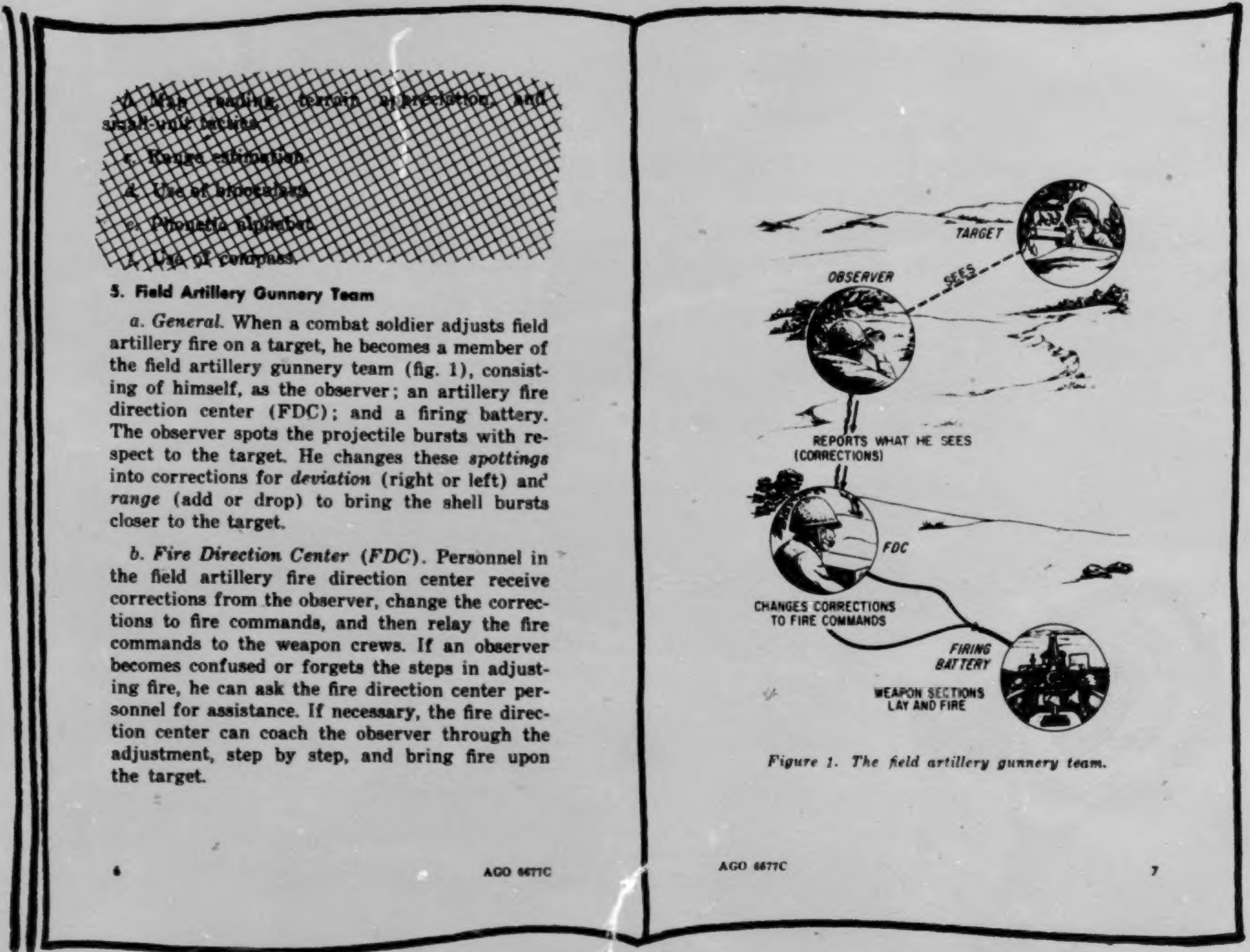
No. of 1 Syll. words/Total No. words: 237/388=70%
FORCAST Reading Grade Level Score: 9.5

AFTER

Type of Literature: **FIELD ARTILLERY - COMBAT**
Rewrite Problem(s):
LONG SENTENCES

No. of 1 Syll. words/Total No. words: **93/157=59%**
FORCAST Reading Grade Level Score: **11.1**

BEFORE



[redacted]

5. Field Artillery Gunnery Team

a. General. When a combat soldier adjusts field artillery fire on a target, he becomes a member of the field artillery gunnery team (fig. 1), consisting of himself, as the observer; an artillery fire direction center (FDC); and a firing battery. The observer spots the projectile bursts with respect to the target. He changes these *spottings* into corrections for *deviation* (right or left) and *range* (add or drop) to bring the shell bursts closer to the target.

b. Fire Direction Center (FDC). Personnel in the field artillery fire direction center receive corrections from the observer, change the corrections to fire commands, and then relay the fire commands to the weapon crews. If an observer becomes confused or forgets the steps in adjusting fire, he can ask the fire direction center personnel for assistance. If necessary, the fire direction center can coach the observer through the adjustment, step by step, and bring fire upon the target.

TARGET
SEES
OBSERVER
REPORTS WHAT HE SEES (CORRECTIONS)
FDC
CHANGES CORRECTIONS TO FIRE COMMANDS
FIRING BATTERY
WEAPON SECTIONS LAY AND FIRE

Figure 1. The field artillery gunnery team.

Type of Literature: **FIELD ARTILLERY - COMBAT**

Primary User: **WORKER**
Information Objectives: **WHAT TO DO**

No. of 1 Syll. words/Total No. words: **98/126=77%**
FORCAST Reading Grade Level Score: **8.4**

AFTER

5. FIELD ARTILLERY GUNNERY TEAM

Sometimes you may have to adjust field artillery fire on a target. You will then become a part of the field artillery gunnery team. The members of this team will be you as the observer; a fire direction center; and a firing battery.

You will spot the shell bursts and tell the fire direction center how far from the target the bursts are. You will tell them if the bursts were left, right, short, or long of the target. If you become confused or forget how to adjust fire, the fire direction center will help you. They will tell you what to do, step by step. They will then change your reports to fire commands and tell the battery where to fire.

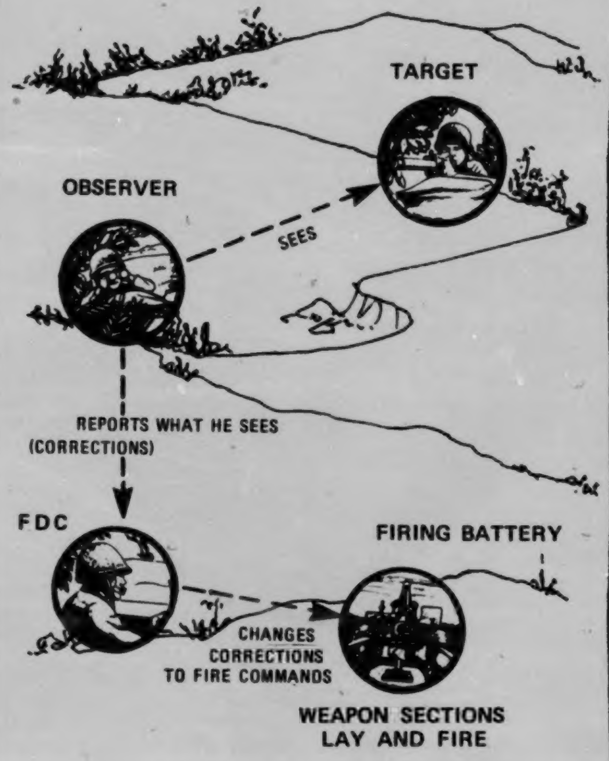


Figure 1. The field artillery gunnery team.

Type of Literature: FIELD ARTILLERY - COMBAT
Rewrite Problem(s):

LONG SENTENCES	REMOTE REFERENCES
NOT DIRECT	WEAK VISUAL AIDS
CONFUSING	RUN-TOGETHER FORMAT

No. of 1 Syll. words/Total No. words: 232/369=63%
FORCAST Reading Grade Level Score: 10.5

BEFORE

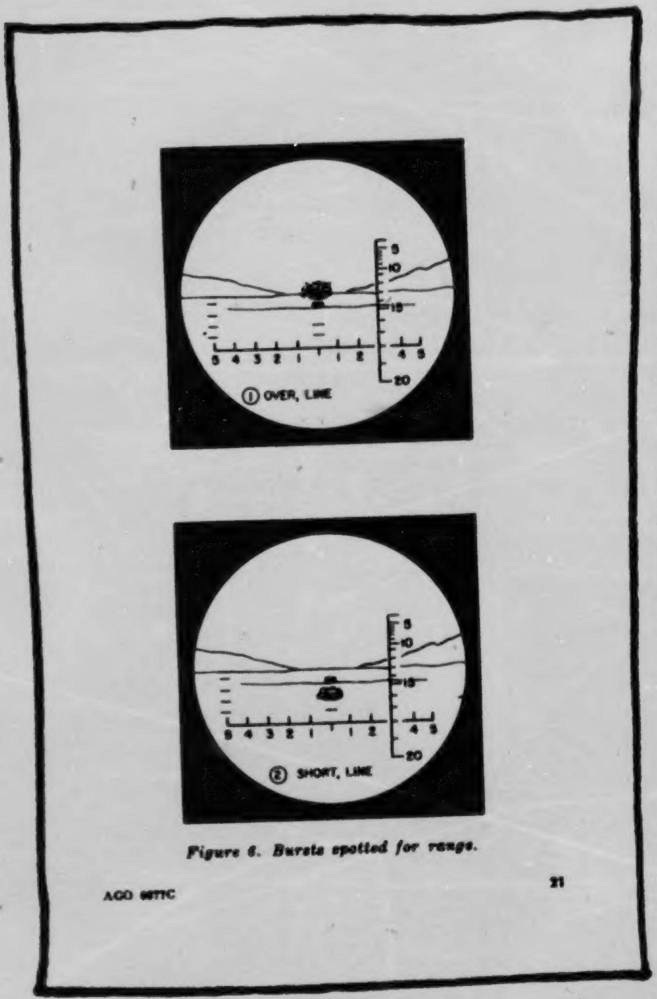
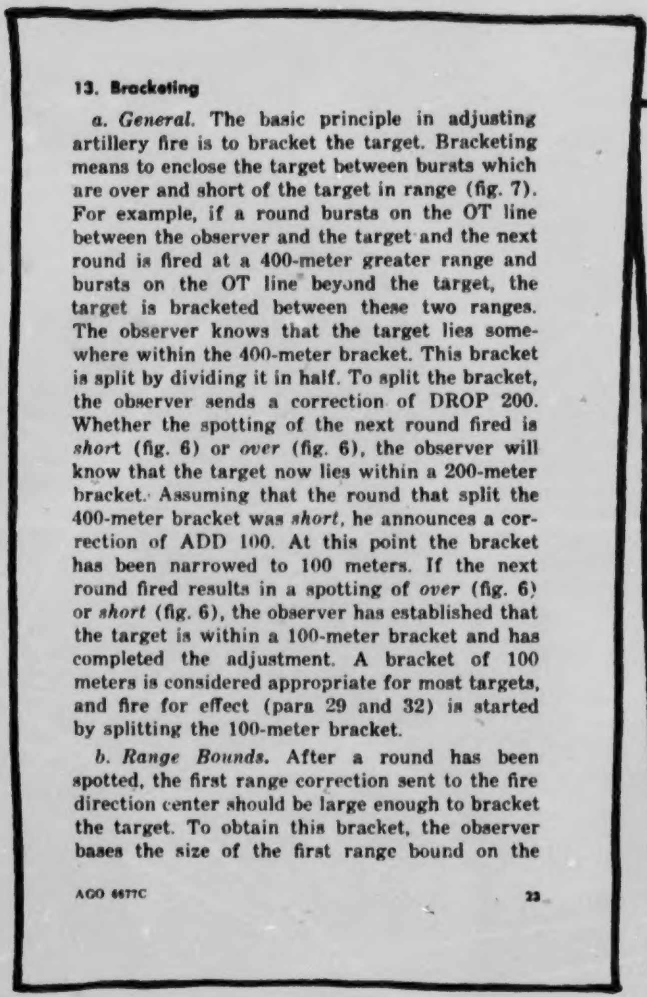

5
10
15
20
5 4 3 2 1 1 2 4 5
① OVER, LINE
5
10
15
20
5 4 3 2 1 1 2 4 5
② SHORT, LINE

Figure 6. Bursts spotted for range.

AGO 6677C 21



13. Bracketing

a. General. The basic principle in adjusting artillery fire is to bracket the target. Bracketing means to enclose the target between bursts which are over and short of the target in range (fig. 7). For example, if a round bursts on the OT line between the observer and the target and the next round is fired at a 400-meter greater range and bursts on the OT line beyond the target, the target is bracketed between these two ranges. The observer knows that the target lies somewhere within the 400-meter bracket. This bracket is split by dividing it in half. To split the bracket, the observer sends a correction of DROP 200. Whether the spotting of the next round fired is *short* (fig. 6) or *over* (fig. 6), the observer will know that the target now lies within a 200-meter bracket. Assuming that the round that split the 400-meter bracket was *short*, he announces a correction of ADD 100. At this point the bracket has been narrowed to 100 meters. If the next round fired results in a spotting of *over* (fig. 6) or *short* (fig. 6), the observer has established that the target is within a 100-meter bracket and has completed the adjustment. A bracket of 100 meters is considered appropriate for most targets, and fire for effect (para 29 and 32) is started by splitting the 100-meter bracket.

b. Range Bounds. After a round has been spotted, the first range correction sent to the fire direction center should be large enough to bracket the target. To obtain this bracket, the observer bases the size of the first range bound on the

AGO 6677C 23

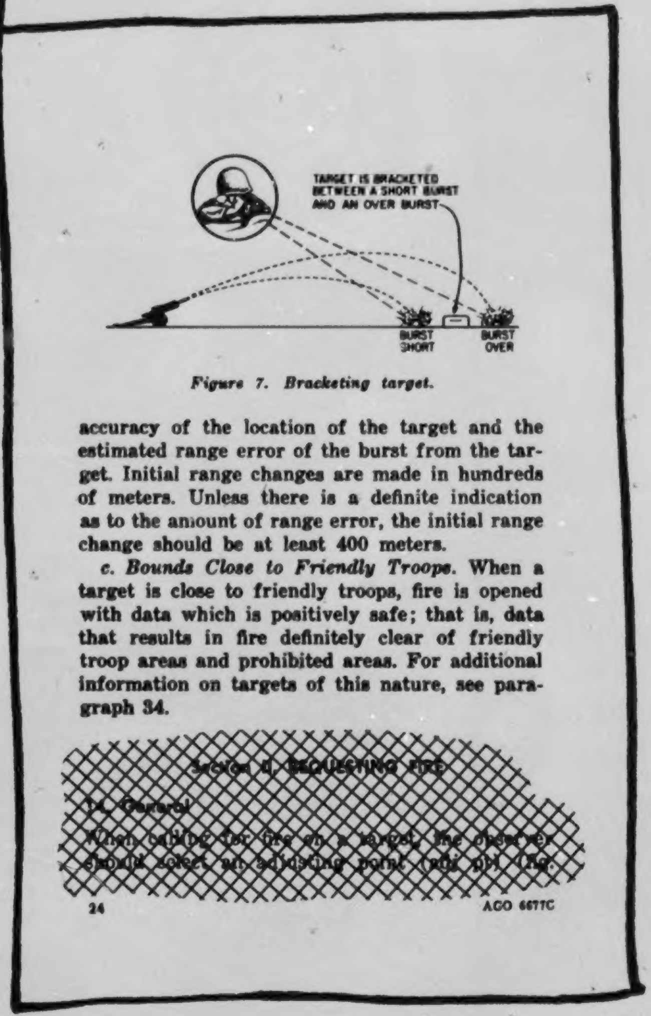

TARGET IS BRACKETED
BETWEEN A SHORT BURST
AND AN OVER BURST
BURST
SHORT
BURST
OVER

Figure 7. Bracketing target.

accuracy of the location of the target and the estimated range error of the burst from the target. Initial range changes are made in hundreds of meters. Unless there is a definite indication as to the amount of range error, the initial range change should be at least 400 meters.

c. Bounds Close to Friendly Troops. When a target is close to friendly troops, fire is opened with data which is positively safe; that is, data that results in fire definitely clear of friendly troop areas and prohibited areas. For additional information on targets of this nature, see paragraph 34.

[redacted]

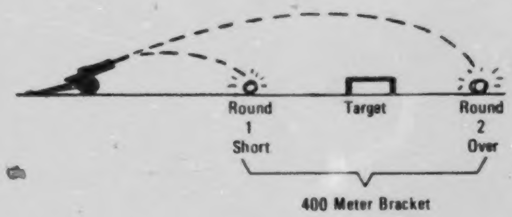
24 AGO 6677C

13. BRACKETING

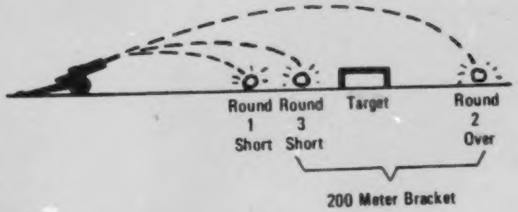
When you adjust artillery fire, you should try to catch the target between bursts which are *over* and bursts which are *short*. This is called *bracketing* the target.

After the first round has been spotted on the Observer-Target (OT) line, you must make a range correction. It should be large enough to bracket the target. Use the accuracy of the target location and the estimated range error of the burst from the target to make the first range change. The first change will always be in hundreds of meters. Unless you are sure of the size of the range error, the first change should be at least 400 meters.

Let's make an example to help you understand how to bracket a target. A round bursts on the OT line *short* of the target. The next round is fired at a range 400-meters greater, and it bursts on the OT line *over* the target. The target is now bracketed between these two rounds.



You know the target is somewhere in that 400-meter bracket. To get closer to the target, you will split the bracket in half. You call *drop* 200. The third round is fired 200 meters shorter than the second. The round is *short*. Now you know the target is in a 200-meter bracket between the second and third rounds.

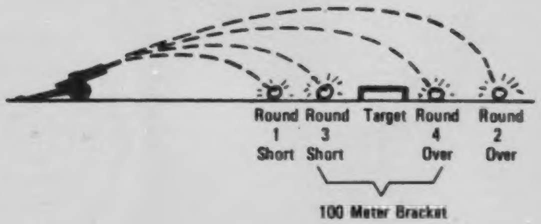


Next you will split the 200-meter bracket in half. You call *add* 100. The fourth round is fired 100 meters further than the third. The round is *over*. You now know the target is in a 100-meter bracket between the third and fourth rounds.

Type of Literature: **FIELD ARTILLERY - COMBAT**

Primary User: **WORKER**
Information Objectives: **WHAT TO DO**

No. of 1 Syll. words/Total No. words: **235/321=73%**
FORCAST Reading Grade Level Score: **9.0**



A bracket of 100 meters is good enough for most targets, so you have finished the adjustment of fire. You can now split the 100-meter bracket to start *fire for effect*.

NOTE: When a target is close to friendly troops, open fire only when you are *sure* the rounds will clear the troops and any prohibited area.

[redacted]

AFTER

Type of Literature: FIELD ARTILLERY - COMBAT
Rewrite Problem(s):
HARD WORDS RUN-TOGETHER FORMAT
TOO VAGUE
TOO WORDY

No. of 1 Syll. words/Total No. words: 319/604=53%
FORCAST Reading Grade Level Score: 12.0

BEFORE

Chapter 12

DECONTAMINATION OF EQUIPMENT

124. General

Equipment that has been contaminated with chemical, biological or radiological agents constitutes a hazard to personnel and must be removed or neutralized. The spreading of an injurious agent can affect persons, objects, and terrain. The process of covering, removing, or destroying a contaminating agent or changing the agent into a harmless substance is referred to as decontamination. Generally only equipment contaminated by persistent agents needs to be decontaminated.

125. Decontamination for Chemical Agents

a. *Ammunition.* Ammunition, especially the brass parts, contaminated with chemical agents usually will corrode. Wipe off the visible contaminant with rags. Use a DANC (decontamination agent, noncorrosive) solution or its future replacement DS2 to decontaminate ammunition contaminated with a liquid blister agent or V-agent. Then, wipe ammunition with a solvent-soaked rag and dry. If neither DS2 nor DANC solution is available, wash ammunition with cool, soapy water; then rinse and dry. Slurry (equal weights of water and chloride of lime) can be used on contaminated ammunition containers, but it must not be allowed to seep into the ammunition itself. DS2, warm soapy water, or aeration in sun or warm air will effectively decontaminate G-agents. A DANC solution cannot be used for decontamination of these particular agents.

b. *Optical Instruments.* Decontamination of glass, plastic, and rubber requires a great deal of care. In general, instruments should be decontaminated by blotting off the contaminant, wiping the items with solvent, and then allowing them to aerate. Some plastics can be decontaminated by using a rag dampened with DANC, drying the material with a clean rag, and then applying a coat of machine oil. DANC solutions affect transparent plastics and rubber and cannot be used on these materials; however, DS2 can be safely used on plastics and rubber if it is rinsed off with clear water after 30 minutes.

c. *Weapons.* Remove dirt, dust, grease, and oil from weapons. Do not apply wet mix but allow surfaces to air after oil and dirt have been removed. DS2 or DANC solution can be used on all metal surfaces except the bore. Firing the weapon is the recommended method for decontamination of the bore; however, if this is not practical, the bore can be decontaminated with cleaning solvent or hot soapy water. After decontamination, weapons are dried and oiled.

d. *Automotive Equipment.* Vehicles only lightly contaminated with chemical agents can be decontaminated by aeration. For heavy contamination, use DANC or DS2 solution on interior and exterior surfaces that personnel are likely to touch. For large areas of decontamination, wash vehicle with water and scrub painted surfaces with soap and water.

126. Decontamination for Biological and Radiological Agents

a. *General.* After a contaminating attack, equipment can be decontaminated either by waiting to permit the decay of contamination or by using active decontamination measures to reduce the contamination to a level at which it is no longer a significant hazard to operating personnel. Decontamination may be either rough or detailed, depending on the urgency of the military situation. The procedure adopted will be a command decision.

b. *Rough Decontamination.* Rough decontamination is performed when urgency is the main factor. Its purpose is to reduce contamination sufficiently to permit personnel to work with, or close to, contaminated equipment for limited periods. Rough decontamination can be achieved by means of water or steam, if available. Soap or other detergents used in conjunction with water or steam aids in decontamination.

c. *Detailed Decontamination.* Detailed decontamination, in which the emphasis is on thoroughness, will be carried out in rear areas and repair bases and includes procedures of surface decontamination, aging, sealing, and disposal.

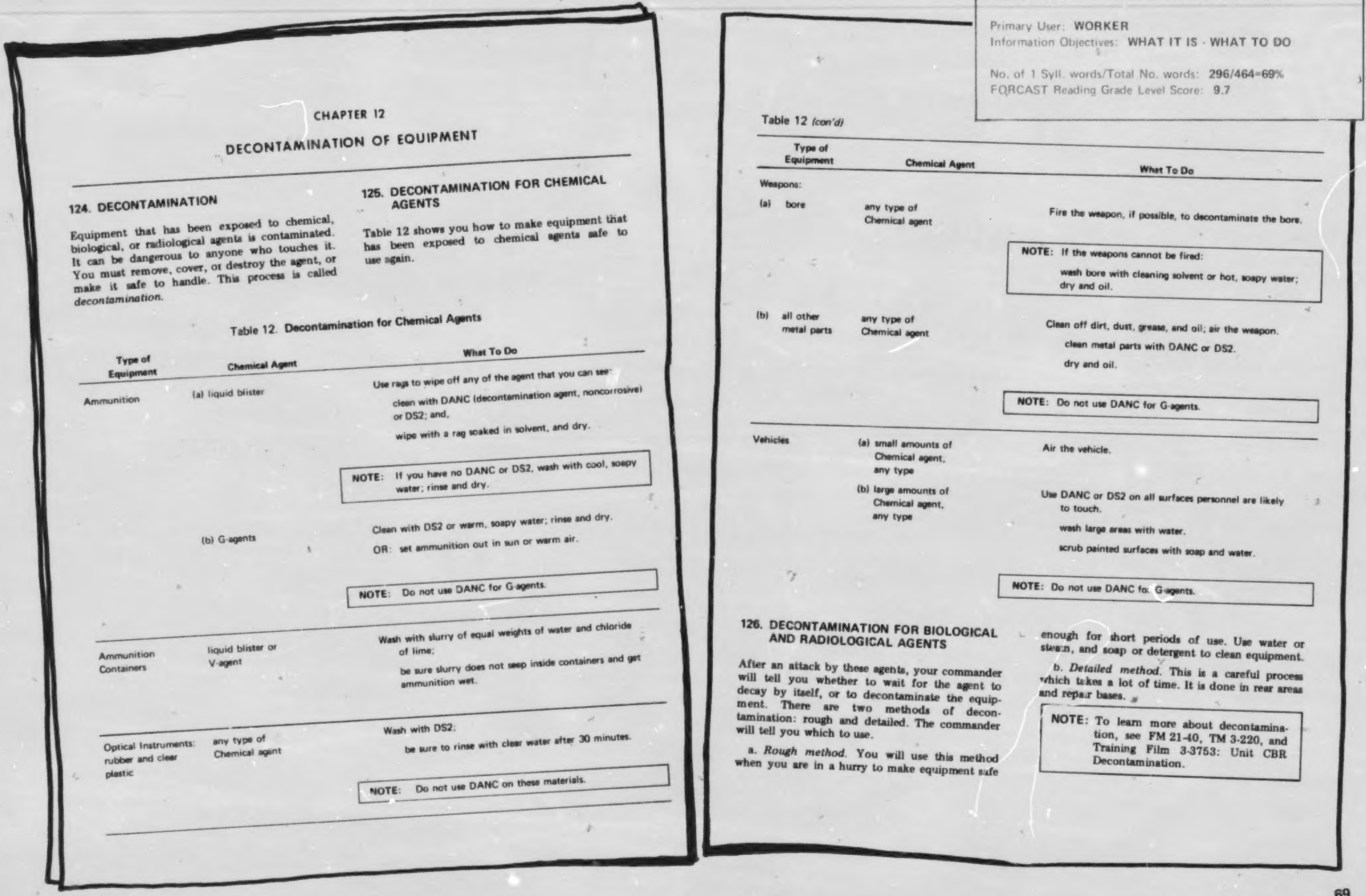
127. References

For further information on decontamination see FM 21–40, TM 3–220, and Training Film 3–3753, Unit CBR Decontamination.

Type of Literature: **FIELD ARTILLERY - COMBAT**

Primary User: **WORKER**
Information Objectives: **WHAT IT IS - WHAT TO DO**

No. of 1 Syll. words/Total No. words: **296/464=69%**
FORCAST Reading Grade Level Score: **9.7**



CHAPTER 12

DECONTAMINATION OF EQUIPMENT

124. DECONTAMINATION

Equipment that has been exposed to chemical, biological, or radiological agents is contaminated. It can be dangerous to anyone who touches it. You must remove, cover, or destroy the agent, or make it safe to handle. This process is called *decontamination.*

125. DECONTAMINATION FOR CHEMICAL AGENTS

Table 12 shows you how to make equipment that has been exposed to chemical agents safe to use again.

Table 12. Decontamination for Chemical Agents

Type of Equipment	Chemical Agent	What To Do
Ammunition	(a) liquid blister	Use rags to wipe off any of the agent that you can see: clean with DANC (decontamination agent, noncorrosive) or DS2; and, wipe with a rag soaked in solvent, and dry. NOTE: If you have no DANC or DS2, wash with cool, soapy water; rinse and dry.
	(b) G-agents	Clean with DS2 or warm, soapy water; rinse and dry. OR: set ammunition out in sun or warm air. NOTE: Do not use DANC for G-agents.
Ammunition Containers	liquid blister or V-agent	Wash with slurry of equal weights of water and chloride of lime; be sure slurry does not seep inside containers and get ammunition wet.
Optical Instruments: rubber and clear plastic	any type of Chemical agent	Wash with DS2; be sure to rinse with clear water after 30 minutes. NOTE: Do not use DANC on these materials.

Table 12 *(con'd)*

Type of Equipment	Chemical Agent	What To Do
Weapons:		
(a) bore	any type of Chemical agent	Fire the weapon, if possible, to decontaminate the bore. NOTE: If the weapons cannot be fired: wash bore with cleaning solvent or hot, soapy water; dry and oil.
(b) all other metal parts	any type of Chemical agent	Clean off dirt, dust, grease, and oil; air the weapon. clean metal parts with DANC or DS2. dry and oil. NOTE: Do not use DANC for G-agents.
Vehicles	(a) small amounts of Chemical agent, any type	Air the vehicle.
	(b) large amounts of Chemical agent, any type	Use DANC or DS2 on all surfaces personnel are likely to touch. wash large areas with water. scrub painted surfaces with soap and water. NOTE: Do not use DANC for G-agents.

126. DECONTAMINATION FOR BIOLOGICAL AND RADIOLOGICAL AGENTS

After an attack by these agents, your commander will tell you whether to wait for the agent to decay by itself, or to decontaminate the equipment. There are two methods of decontamination: rough and detailed. The commander will tell you which to use.

a. *Rough method.* You will use this method when you are in a hurry to make equipment safe enough for short periods of use. Use water or steam, and soap or detergent to clean equipment.

b. *Detailed method.* This is a careful process which takes a lot of time. It is done in rear areas and repair bases.

NOTE: To learn more about decontamination, see FM 21-40, TM 3-220, and Training Film 3-3753: Unit CBR Decontamination.

AFTER

Type of Literature: **INFANTRY - TECHNICAL**
Rewrite Problem(s):
WEAK VISUAL AIDS
RUN-TOGETHER FORMAT

No. of 1 Syll. words/Total No. words: 155/202=77%
FORCAST Reading Grade Level Score: 8.4

B E F O R E

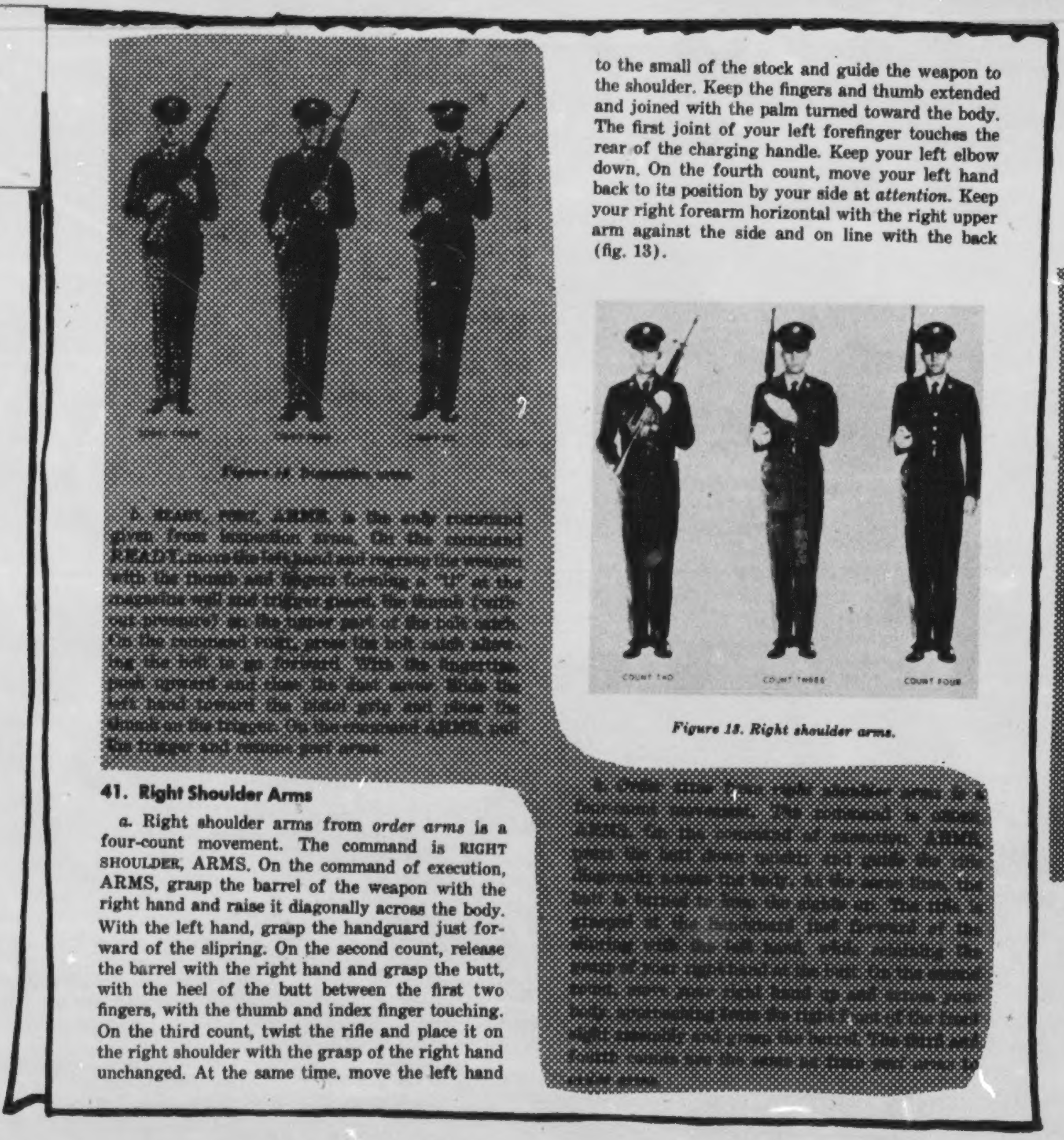


Figure 14. Inspection arms.

b. READY, PORT, ARMS, is the only command given from inspection arms. On the command READY, move the left hand and regrasp the weapon with the thumb and fingers forming a "U" at the magazine well and trigger guard, the thumb (without pressure) on the upper part of the bolt catch. On the command PORT, press the bolt catch allowing the bolt to go forward. With the fingertips push upward and close the dust cover. Slide the left hand toward the pistol grip and place the thumb on the trigger. On the command ARMS, pull the trigger and resume port arms.

41. Right Shoulder Arms

a. Right shoulder arms from *order arms* is a four-count movement. The command is RIGHT SHOULDER, ARMS. On the command of execution, ARMS, grasp the barrel of the weapon with the right hand and raise it diagonally across the body. With the left hand, grasp the handguard just forward of the slipring. On the second count, release the barrel with the right hand and grasp the butt, with the heel of the butt between the first two fingers, with the thumb and index finger touching. On the third count, twist the rifle and place it on the right shoulder with the grasp of the right hand unchanged. At the same time, move the left hand to the small of the stock and guide the weapon to the shoulder. Keep the fingers and thumb extended and joined with the palm turned toward the body. The first joint of your left forefinger touches the rear of the charging handle. Keep your left elbow down. On the fourth count, move your left hand back to its position by your side at *attention*. Keep your right forearm horizontal with the right upper arm against the side and on line with the back (fig. 13).

Figure 13. Right shoulder arms.

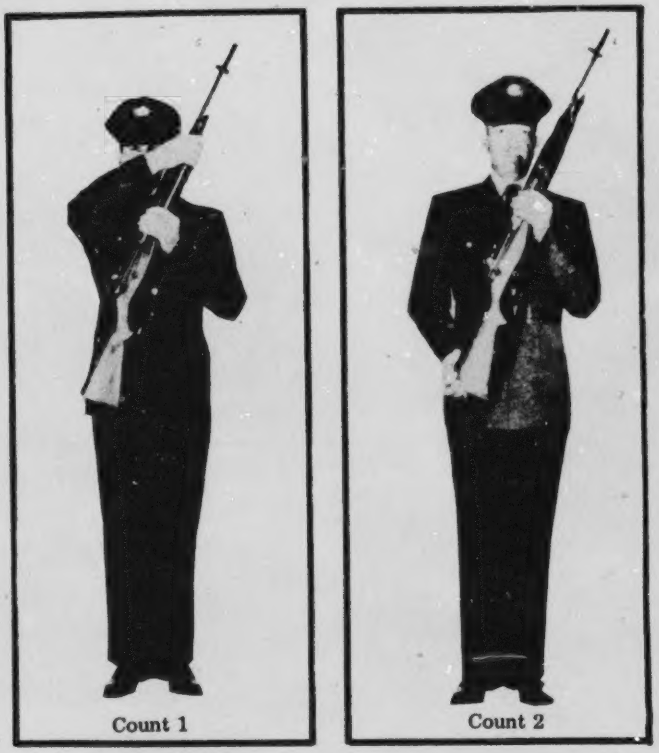
b. Order arms from right shoulder arms is a four-count movement. The command is ORDER, ARMS. On the command of execution, ARMS, [illegible]

Type of Literature: **INFANTRY - TECHNICAL**

Primary User: **INSTRUCTOR - WORKER**
Information Objectives: **HOW TO DO IT**

No. of 1 Syll. words/Total No. words: **156/204=76%**
FORCAST Reading Grade Level Score: **8.6**

Figure 13. Right Shoulder Arms


Count 1
Count 2

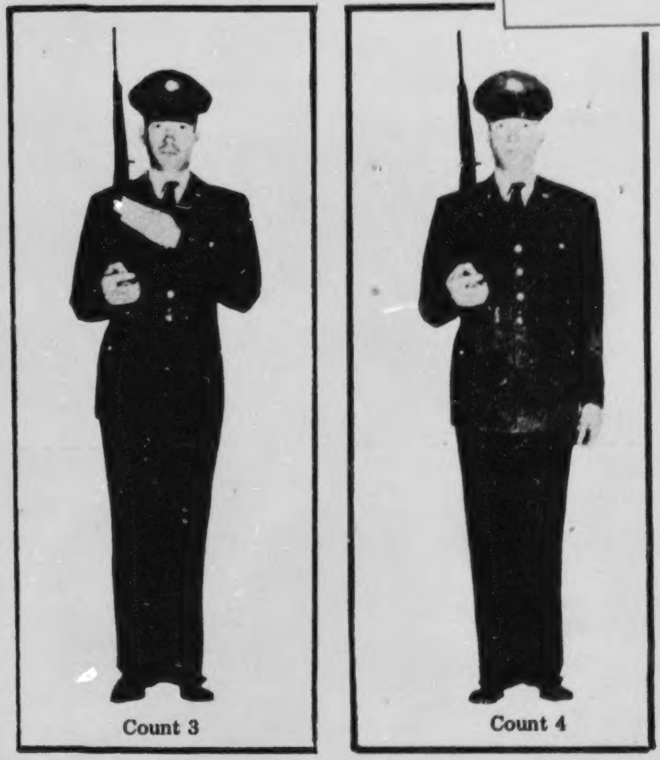
41. Right Shoulder Arms

The starting position is *order arms.* The command is RIGHT SHOULDER, ARMS. The command of execution is ARMS. The movement takes four counts. Figure 13 shows the count positions.

Count 1: Grasp the barrel of the weapon with the right hand and raise it diagonally across the body. With the left hand, grasp the handguard just forward of the slipring.

Count 2: Release the barrel with the right hand and grasp the butt, with the heel of the butt between the first two fingers, with the thumb and index finger touching.

Figure 13—Continued


Count 3
Count 4

Count 3: Without changing the grasp of the right hand, twist the rifle and place it on the right shoulder. At the same time, move the left hand to the small of the stock and guide the weapon to the shoulder. Keep the fingers and thumb extended and joined, with the palm turned toward the body. The first joint of your left forefinger touches the rear of the charging handle. Keep your left elbow down.

Count 4: Move your left hand back to its position by your side, as at attention. Keep your right forearm horizontal, with the right upper arm against the side and on line with the back.

AFTER

B
E
F
O
R
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Type of Literature: INFANTRY - TECHNICAL
Rewrite Problem(s):
- NOT DIRECT
REMOTE REFERENCES
WEAK VISUAL AIDS

No. of 1 Syll. words/Total No. words: 144/257=56%
FORCAST Reading Grade Level Score: 11.6

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Purpose and Scope

This manual provides guidance for presenting instruction with the rifle, 5.56-mm, M16A1. (Guidance provided herein is also applicable to the rifle, M16). It contains a detailed description of the rifle and its general characteristics, procedures for disassembly and assembly, operation and functioning of the rifle, types of ammunition, and maintenance. When supplemented by FM 23-71 and FM 23-16, it provides information in sufficient detail for conducting marksmanship training with the rifle. This manual is applicable to both nonnuclear and nuclear warfare.

2. Responsibilities of Commanders

Users of this publication are encouraged to submit recommended changes and comments to improve the publication. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons will be provided for each comment to insure understanding and complete evaluation. Comments should be prepared using DA Form 2028 (Recommended Changes to Publications) and forwarded direct to the Commandant, U.S. Army Infantry School, Fort Benning, Georgia 31905.

Section II. CHARACTERISTICS

3. Description of the Rifle

a. The rifle, M16A1 (fig 1), is a 5.56-mm, magazine-fed, gas-operated, air-cooled, shoulder weapon. It is designed for either semiautomatic or full automatic fire through the use of a selector lever.

b. The rifle is equipped with a flash suppressor which also serves as a stationary piston permitting the launching of rifle grenades without the use of supplementary attachments.

c. The barrel is surrounded by two aluminum-lined fiberglass handguards which are notched to permit air to circulate around the barrel, and further serve to protect the gas tube.

d. A hard rubber pad is attached to the butt of the stock to partially reduce the effects of recoil.

e. A forward assist assembly located on the right rear of the upper receiver permits the closing of the bolt when this is not done by the forces of the action spring.

Note. Provided in M16A1 only. M16 version does not provide forward assist assembly (fig 2).

f. A "clothespin" bipod is used in the prone and foxhole positions. The bipod is attached to the barrel directly beneath the front sight between the bayonet lug and the front sling swivel (fig 3).

g. The trigger guard is easily adaptable to winter operations. A spring-loaded retaining pin is depressed with a cartridge point to allow ready access to the trigger when wearing arctic mittens.

h. An ejector port cover is provided to prevent dirt or sand from getting into the ejection port. The cover should be closed during periods when firing is not anticipated. It will open automatically by the forward or rearward movement of the bolt carrier.

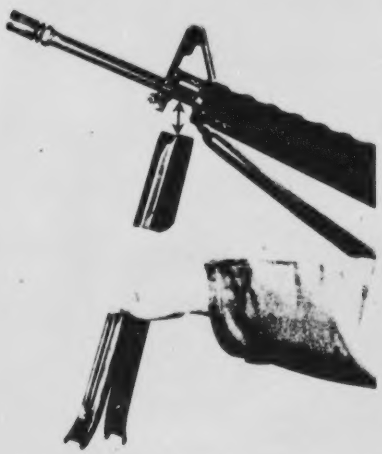


Figure 3. Attaching the bipod.

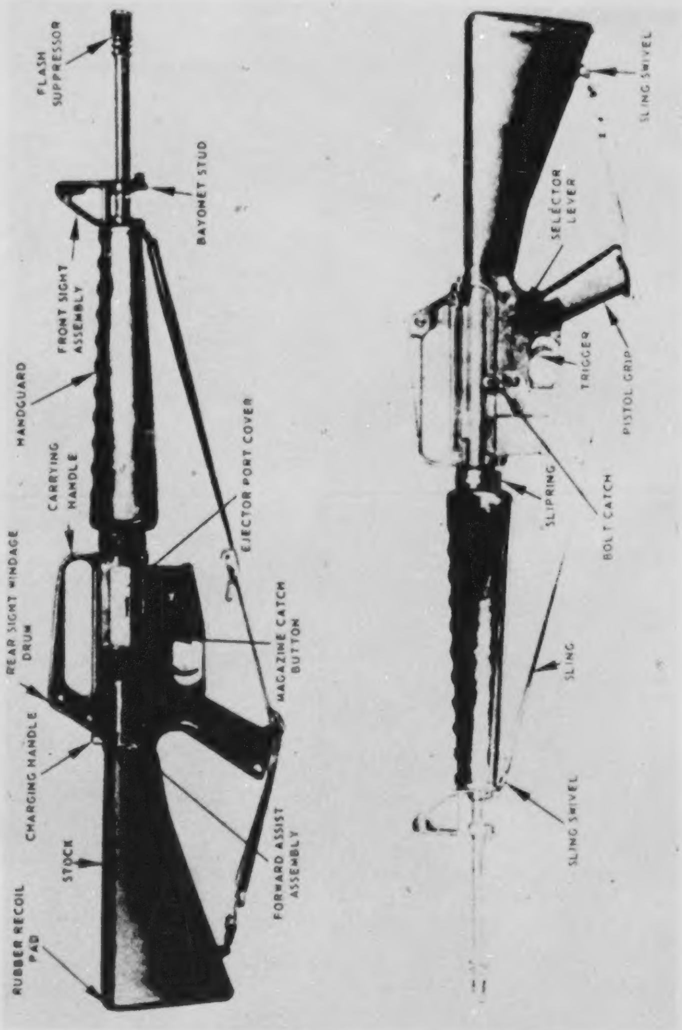


Figure 1. Rifle, 5.56-mm, M16A1, right and left side views.

Type of Literature: INFANTRY - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT IT LOOKS LIKE -
WHAT IT'S FOR
No. of 1 Syll. words/Total No. words: 47/66=71%
FORCAST Reading Grade Level Score: 9.3

Section II. CHARACTERISTICS

3. Description of the Rifle

The M16A1 is a 5.56-mm rifle that can be fired from the shoulder. The ammunition is fed into the rifle by a magazine. The rifle operates through the action of the gas in the gas tube and is cooled by air. Figure 1 shows you the M16A1 rifle and gives you the names of its external parts. Figure 2 shows you special features of the rifle.

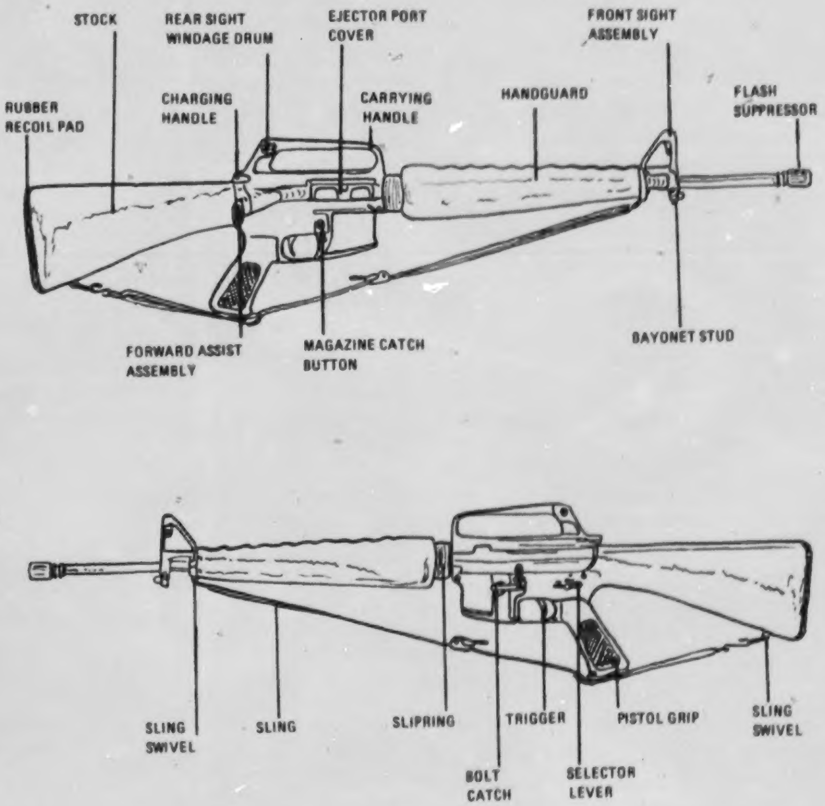
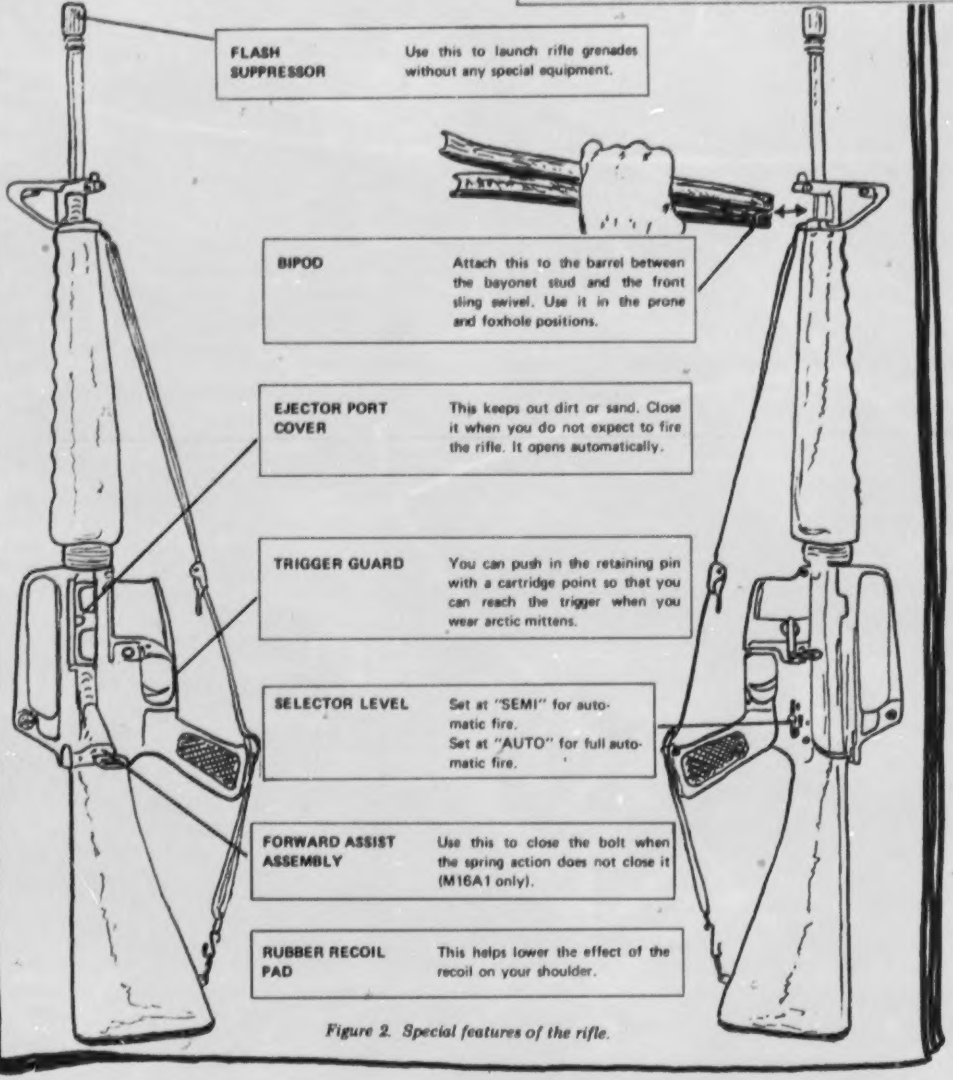


Figure 1. Rifle, 5.56-mm, M16A1, right and left side views.



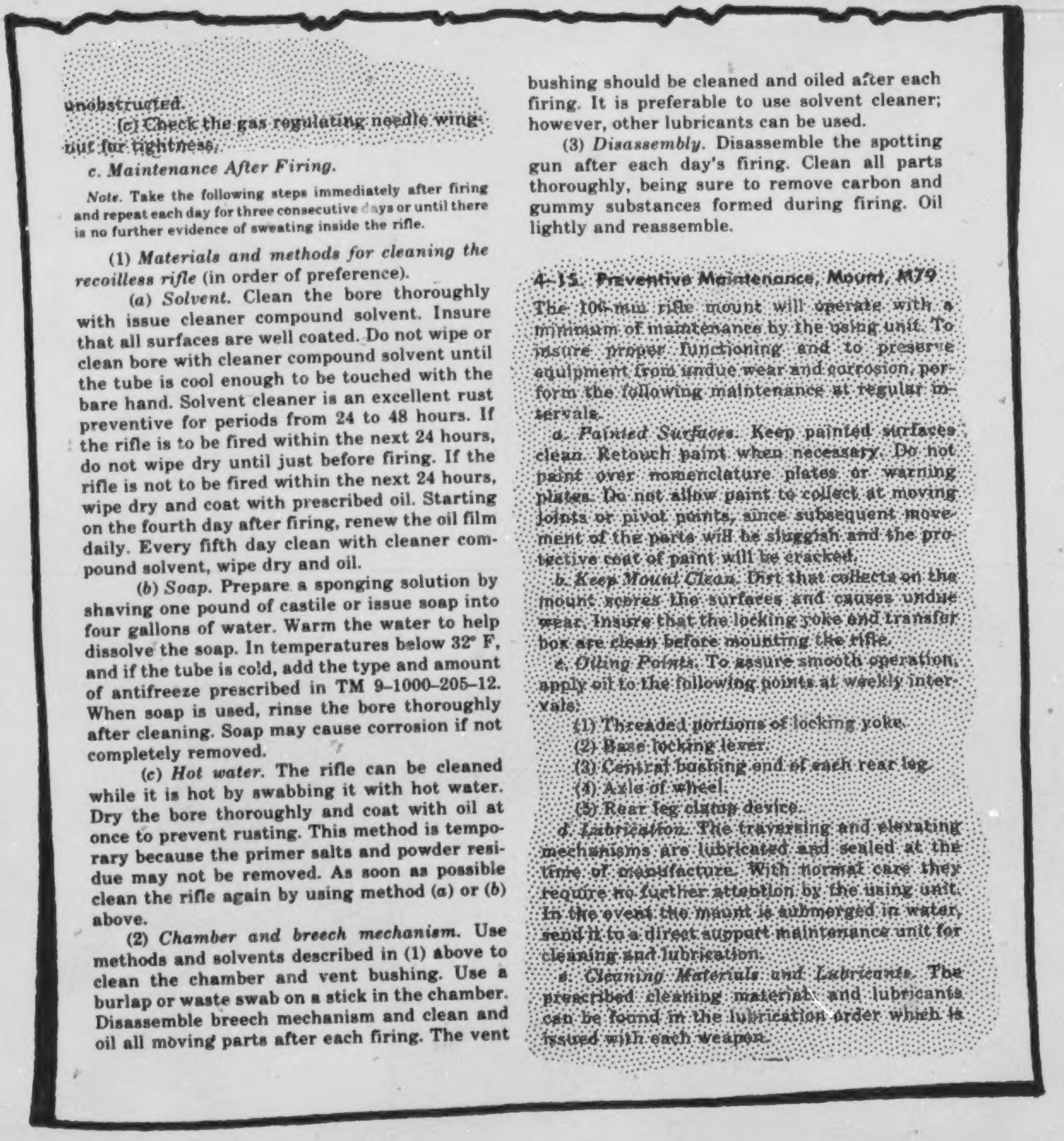
FLASH SUPPRESSOR	Use this to launch rifle grenades without any special equipment.
BIPOD	Attach this to the barrel between the bayonet stud and the front sling swivel. Use it in the prone and foxhole positions.
EJECTOR PORT COVER	This keeps out dirt or sand. Close it when you do not expect to fire the rifle. It opens automatically.
TRIGGER GUARD	You can push in the retaining pin with a cartridge point so that you can reach the trigger when you wear arctic mittens.
SELECTOR LEVEL	Set at "SEMI" for automatic fire. Set at "AUTO" for full automatic fire.
FORWARD ASSIST ASSEMBLY	Use this to close the bolt when the spring action does not close it (M16A1 only).
RUBBER RECOIL PAD	This helps lower the effect of the recoil on your shoulder.

Figure 2. Special features of the rifle.

AFTER

Type of Literature: INFANTRY - TECHNICAL
Rewrite Problem(s):
HARD WORDS
CONFUSING
RUN-TOGETHER FORMAT
No. of 1 Syll. words/Total No. words: 236/384=61%
FORCAST Reading Grade Level Score: 10.9

BEFORE



unobstructed.

(c) Check the gas regulating needle wingnut for tightness.

c. Maintenance After Firing.

Note. Take the following steps immediately after firing and repeat each day for three consecutive days or until there is no further evidence of sweating inside the rifle.

(1) *Materials and methods for cleaning the recoilless rifle* (in order of preference).

(a) *Solvent.* Clean the bore thoroughly with issue cleaner compound solvent. Insure that all surfaces are well coated. Do not wipe or clean bore with cleaner compound solvent until the tube is cool enough to be touched with the bare hand. Solvent cleaner is an excellent rust preventive for periods from 24 to 48 hours. If the rifle is to be fired within the next 24 hours, do not wipe dry until just before firing. If the rifle is not to be fired within the next 24 hours, wipe dry and coat with prescribed oil. Starting on the fourth day after firing, renew the oil film daily. Every fifth day clean with cleaner compound solvent, wipe dry and oil.

(b) *Soap.* Prepare a sponging solution by shaving one pound of castile or issue soap into four gallons of water. Warm the water to help dissolve the soap. In temperatures below 32° F, and if the tube is cold, add the type and amount of antifreeze prescribed in TM 9-1000-205-12. When soap is used, rinse the bore thoroughly after cleaning. Soap may cause corrosion if not completely removed.

(c) *Hot water.* The rifle can be cleaned while it is hot by swabbing it with hot water. Dry the bore thoroughly and coat with oil at once to prevent rusting. This method is temporary because the primer salts and powder residue may not be removed. As soon as possible clean the rifle again by using method (a) or (b) above.

(2) *Chamber and breech mechanism.* Use methods and solvents described in (1) above to clean the chamber and vent bushing. Use a burlap or waste swab on a stick in the chamber. Disassemble breech mechanism and clean and oil all moving parts after each firing. The vent bushing should be cleaned and oiled after each firing. It is preferable to use solvent cleaner; however, other lubricants can be used.

(3) *Disassembly.* Disassemble the spotting gun after each day's firing. Clean all parts thoroughly, being sure to remove carbon and gummy substances formed during firing. Oil lightly and reassemble.

4-15. Preventive Maintenance, Mount, M79

The 106-mm rifle mount will operate with a minimum of maintenance by the using unit. To insure proper functioning and to preserve equipment from undue wear and corrosion, perform the following maintenance at regular intervals.

a. Painted Surfaces. Keep painted surfaces clean. Retouch paint when necessary. Do not paint over nomenclature plates or warning plates. Do not allow paint to collect at moving joints or pivot points, since subsequent movement of the parts will be sluggish and the protective coat of paint will be cracked.

b. Keep Mount Clean. Dirt that collects on the mount scores the surfaces and causes undue wear. Insure that the locking yoke and transfer box are clean before mounting the rifle.

c. Oiling Points. To assure smooth operation, apply oil to the following points at weekly intervals:

(1) Threaded portions of locking yoke.
(2) Base locking lever.
(3) Central bushing end of each rear leg.
(4) Axle of wheel.
(5) Rear leg clamp device.

d. Lubrication. The traversing and elevating mechanisms are lubricated and sealed at the time of manufacture. With normal care they require no further attention by the using unit. In the event the mount is submerged in water, send it to a direct support maintenance unit for cleaning and lubrication.

e. Cleaning Materials and Lubricants. The prescribed cleaning materials and lubricants can be found in the lubrication order which is issued with each weapon.

b. Maintenance While Firing.

(1) While firing the recoilless rifle—

(a) Check the breechblock, chamber, and bore to be certain they are free of foreign matter.

(b) Inspect the firing pin aperture to insure that it is clean.

(c) Check the firing pin housing cap for tightness.

(2) While firing the spotting gun:

(a) Check the chamber and bore for foreign matter.

(b) Periodically check the face of the bolt and the firing pin aperture to insure they are unobstructed.

(c) Check the gas regulating needle wingnut for tightness.

c. Maintenance After Firing.

On the Day of Firing: Begin these steps immediately after you fire the rifle.

STEP 1: CLEAN THE BORE OF THE 106-MM RIFLE.

(a) First Choice: *Use solvent cleaner.*

Wait until the tube is cool enough to touch with your bare hand.
Clean thoroughly with the issue cleaner compound solvent.
Be sure to coat all surfaces well.
Is the rifle to be fired within the next 24 hours?
IF YES -
Do not wipe it dry until just before you fire the rifle
(The solvent cleaner prevents rust.)
After you fire the rifle, start over with the first step in the cleaning procedure.
IF NO -
Wipe dry.
Coat with the oil that is prescribed for the rifle.
Carry out follow-up care described in Step 4, below.

(b) Second choice: When you do not have solvent cleaner: Use *soap* to prepare a sponging solution.

Shave one pound of the issue soap (or castile soap).
Dissolve in four gallons of warm water.
If the temperature is below 32°F. and if the tube is cold, add the type and amount of antifreeze as given in TM 9-100-205-12.
Wait until tube is cool enough to touch with your bare hands.
Clean the tube.
Rinse the bore thoroughly to remove all soap. (The soap would cause corrosion.)
Coat with the oil that is prescribed for the rifle.
Carry out follow-up care described in Step 4, below.

(c) Last choice: When you do not have solvent cleaner or soap: Use *hot water.*

While bore is still hot, swab it with hot water.
Dry bore thoroughly.
Coat with oil at once.
Clean the bore with solvent cleaner or soap solution as soon as possible.
Carry out follow-up care described in Step 4, below.

STEP 2: CLEAN THE CHAMBER AND BREECH MECHANISM OF THE 106-MM RIFLE.

(a) First Choice: Use solvent cleaner.

Clean the chamber and vent bushing with solvent cleaner.
Use a burlap or waste swab on a stick in the chamber.
Clean breech mechanism. Disassemble and clean all moving parts.
Oil vent bushing and all moving parts of breech mechanism.
Reassemble.

(b) If you do not have solvent cleaner:

Use a soapy solution or hot water, as shown above under "clean the bore".

STEP 3: CLEAN THE CALIBER .50 SPOTTING GUN.

Disassemble.
Clean all parts thoroughly; remove all carbon and gummy substances.
Oil lightly.
Reassemble.

STEP 4: FOLLOW-UP CLEANING OF RIFLE AND SPOTTING GUN

After Firing

Day 1, 2 & 3:	Clean, wipe dry, and oil.
Day 4:	Check for signs of sweating inside rifle. If you find sweating: clean, wipe dry, and oil. If no signs of sweating: renew oil film.
Day 5:	Clean, wipe dry, and oil.
Day 6,7, 8 & 9:	Renew oil film.
Day 10:	Clean, wipe dry and oil.
Day 15 & every 5th day after:	Clean, wipe dry, and oil.

On all other days: Renew oil film daily.

Type of Literature: INFANTRY - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT TO DO

No. of 1 Syll. words/Total No. words: 337/476=71%
FORCAST Reading Grade Level Score: 9.3

**A
F
T
E
R**

Type of Literature: **INFANTRY - TECHNICAL**
Rewrite Problem(s):
HARD WORDS **RUN-TOGETHER FORMAT**
TOO WORDY
WEAK VISUAL AIDS
No. of 1 Syll. words/Total No. words: **384/631=61%**
FORCAST Reading Grade Level Score: **10.8**

B
E
F
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R
E

CHAPTER 3
ROCKET AMMUNITION

15. Technical Characteristics

a. Nose Cap Assembly. The nose cap assembly (fig 8) contains the piezo-electric element which is crushed on impact with the target. When the piezo-electric element is crushed, a small amount of electric energy is developed and transmitted through the lead wire to the fuze. This current initiates the firing train starting at the electrical detonator.

b. Rocket Motor Ignition System. The rocket motor ignition system (fig 9) for the M72A1/M72A1E1 is composed of the following elements: firing pin housing, firing pin rod and firing pin rod spring, M29A1 percussion primer, primer block with black powder flash charge, flash tube, and black powder igniter. The following sequence takes place as the unit is cocked and fixed: The firing pin rod spring is compressed as the inner tube is extended and locked into position (fig 9). When the trigger is actuated, the firing pin rod is released and strikes the center of the M29A1 primer with sufficient force to detonate the primer. The flash from the primer ignites the flash charge located directly behind the primer in the primer block. The ignited black powder generates a flash or flame which travels within the plastic flash tube to the igniter. The flame is dispersed within the igniter body through radial holes in the flash tube extension, igniting the black powder charge in the igniter. The thin plastic film which seals the front surface of the igniter is burned away, allowing the flame front to progress to the propellant and ignite it. The igniter remains in the rocket nozzle until the pressure reaches several hundred pounds per square inch. This pressure level assures that the propellant is ignited and that combustion is stabilized. Further increase in pressure blows out the igniter body, and the rocket will start to accelerate. The time required for this sequence of events is about 40 milliseconds between the time the trigger is squeezed and the launching of the rocket. (For the M72A1 and M72A1E1, the firing pin rod assembly functions the same as the firing pin cable and the firing pin on the M72.)

c. Rocket Propulsion. The rocket is propelled by a discharging jet of hot gas generated by the burning propellant. The basic principle of rocket propulsion may be described as follows: In the case of a rocket motor, the gas pressure is built up by the burning propellant within the motor. When an opening is made at one end of the chamber the pressure at the open end drops to near atmospheric level while the pressure on the closed end or surface remains momentarily much greater than the normal atmospheric pressure. As a result of this unbalanced pressure within the rocket motor the rocket starts to move in the direction of the closed end as a stream or jet of gas is exhausted from the open end or nozzle. The speed and the quantity of the gases escaping to the rear determine the speed of the rocket. Pressure within the rocket motor will be maintained until the propellant is completely burned and, therefore, the rocket will accelerate until the burning of the propellant is completed. The total burning time is controlled by the propellant type and size.

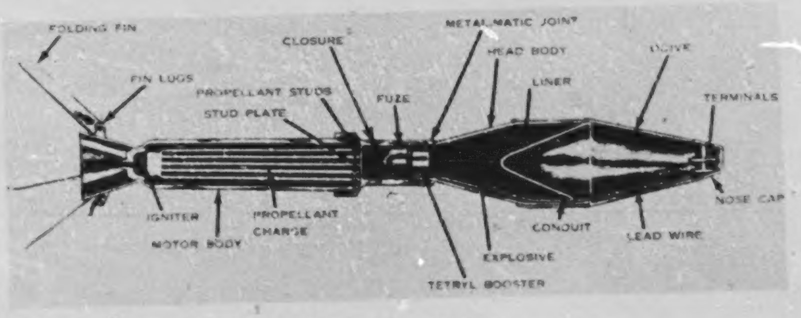


Figure 8. The 66-mm HEAT rocket.

d. Fuze. The M412 fuze is drop-safe and bore-safe. The minimum arming distance is approximately 30 feet. For graze functioning of the fuze, there is a spring-loaded firing pin which is released by decelerating force of graze impact. This fires a stab sensitive primer located adjacent to the detonator. This action, in turn, activates the explosive train which explodes the warhead.

e. Fin Assembly. Six olding fin attachment lugs are attached as an integral part of the motor. These fins are actuated by springs. As the rocket clears the launcher, the fins spring out and stabilize the rocket in flight (fig 8).

[redacted]

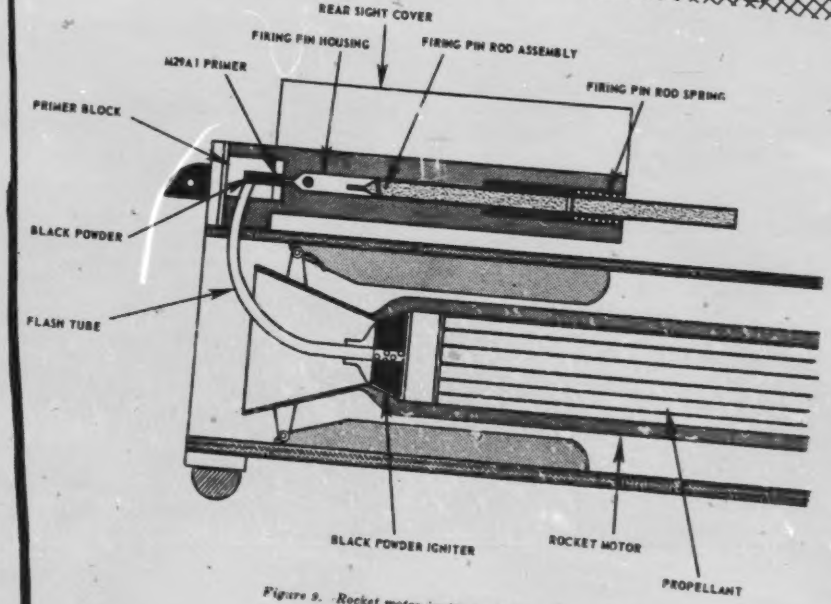


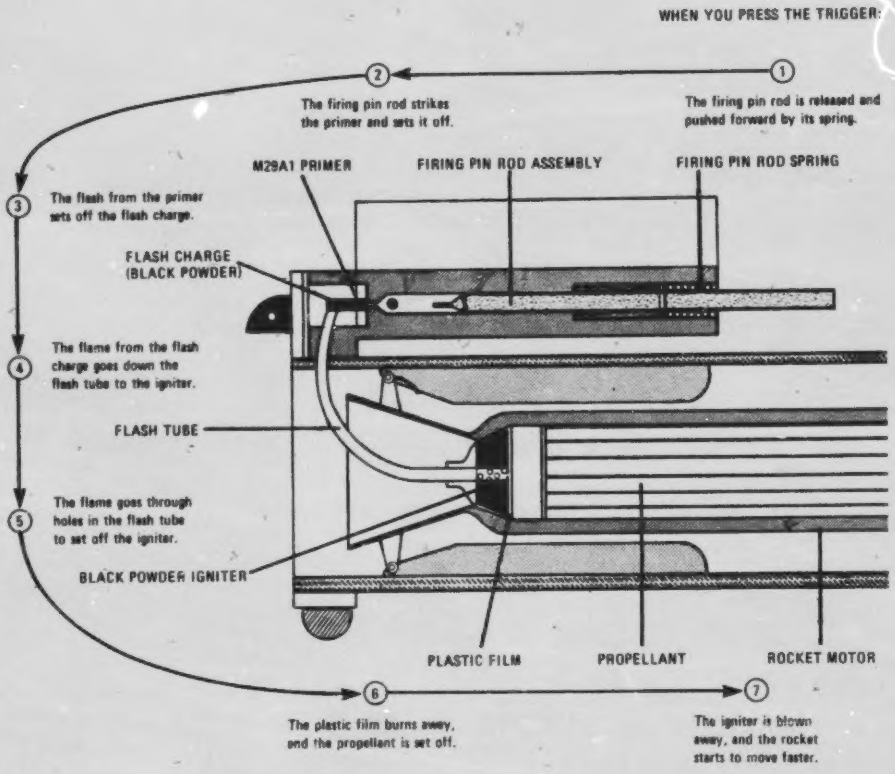
Figure 9. Rocket motor ignition system.

CHAPTER 3

ROCKET AMMUNITION

15. TECHNICAL CONSIDERATIONS

a. *Rocket Motor Ignition System.*


WHEN YOU PRESS THE TRIGGER:
① The firing pin rod is released and pushed forward by its spring.
② The firing pin rod strikes the primer and sets it off.
③ The flash from the primer sets off the flash charge.
④ The flame from the flash charge goes down the flash tube to the igniter.
⑤ The flame goes through holes in the flash tube to set off the igniter.
⑥ The plastic film burns away, and the propellant is set off.
⑦ The igniter is blown away, and the rocket starts to move faster.
M29A1 PRIMER
FIRING PIN ROD ASSEMBLY
FIRING PIN ROD SPRING
FLASH CHARGE (BLACK POWDER)
FLASH TUBE
BLACK POWDER IGNITER
PLASTIC FILM
PROPELLANT
ROCKET MOTOR

b. *Rocket Propulsion.* As the Propellant burns, it gives off a jet of hot gas. It is this gas that pushes the rocket forward. The way the gas works is simple:

(1) The propellant is inside the motor. As the propellant burns, it fills the motor case with gas under pressure.

Type of Literature: INFANTRY - TECHNICAL

Primary User: WORKER
Information Objectives: HOW IT DOES IT

No. of 1 Syll. words/Total No. words: 207/288=72%
FORCAST Reading Grade Level Score: 9.2

(2) When the igniter blows away it leaves a hole in one end of the motor case.

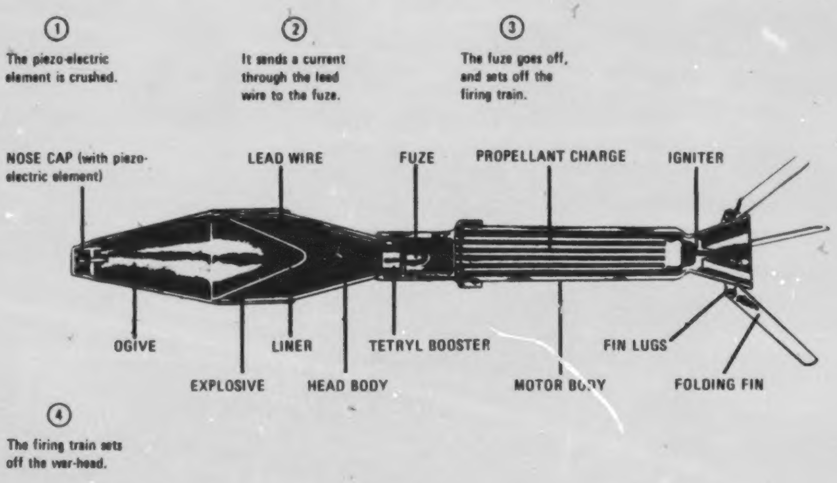
(3) The gas pressure on the open end of the case drops to the same pressure as the air outside the case. The pressure on the closed end is much higher than that on the open end.

(4) The pressure starts to even out inside the case as a jet of gas leaves the open end. This jet pushes the rocket forward. The amount and speed of the gas jet control the speed of the rocket.

(5) As the propellant continues to burn and give off gas, the pressure inside the rocket motor stays uneven. The rocket goes faster and faster until the propellant is all burned. The total burning time depends on the size and type of propellant.

c. *Fins.* Six fin lugs attach six folding fins to the motor case. When the rocket clears the launcher, springs push the fins out into place. The fins steady the rocket, and keep it from spinning in flight.

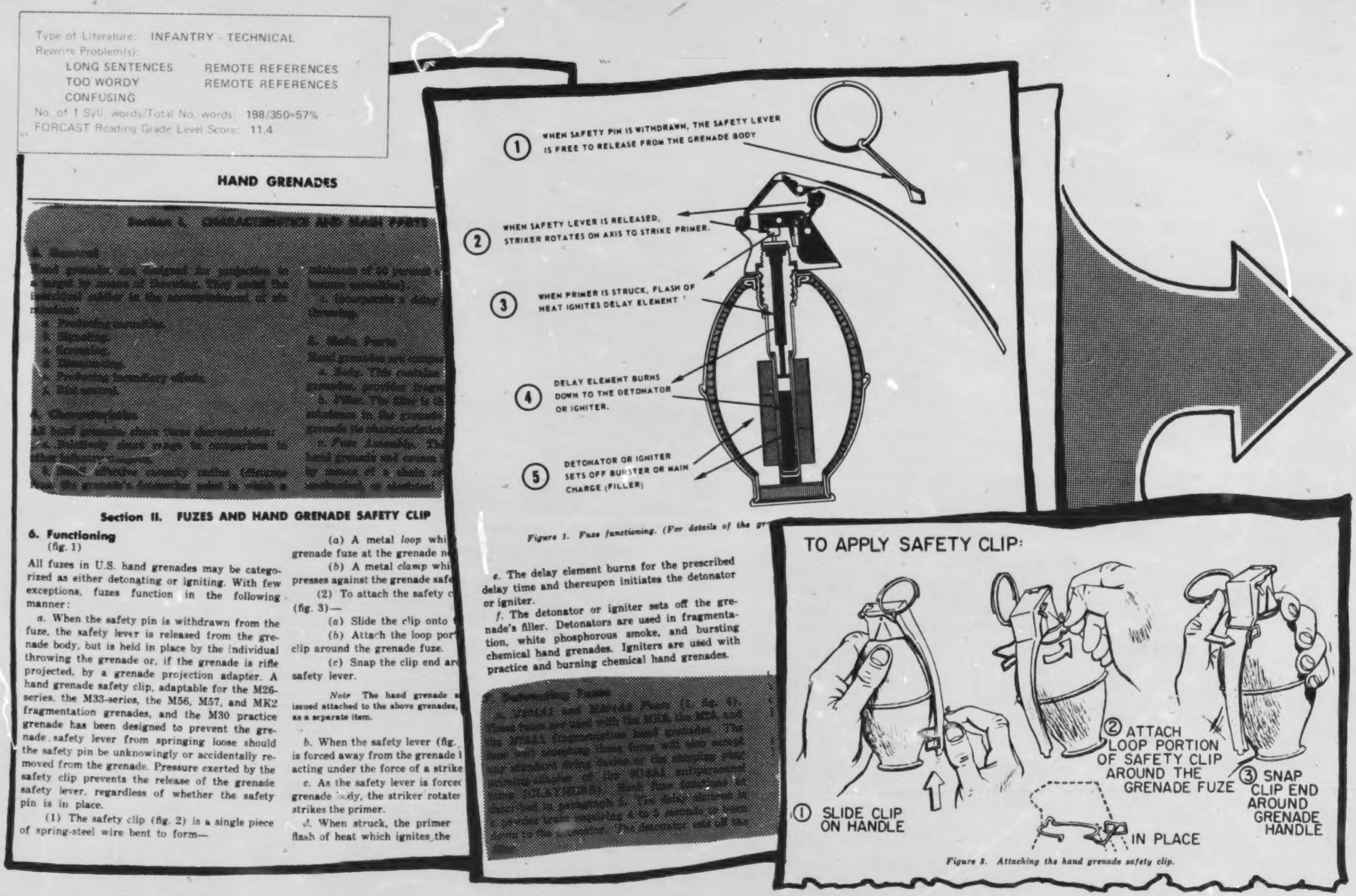
d. *Setting off the warhead.* When the rocket hits the target:


① The piezo-electric element is crushed.
② It sends a current through the lead wire to the fuze.
③ The fuze goes off, and sets off the firing train.
④ The firing train sets off the war-head.
NOSE CAP (with piezo-electric element)
LEAD WIRE
FUZE
PROPELLANT CHARGE
IGNITER
OGIVE
EXPLOSIVE
LINER
HEAD BODY
TETRYL BOOSTER
MOTOR BODY
FIN LUGS
FOLDING FIN

e. *Fuse.* The M412 fuse is drop-safe and bore-safe. It has an arming distance of 30 feet or more. In a direct hit, the piezo-electric element in the nose cap sets off the fuse. In grazing fire, the glancing impact against the ground or objects slows down the rocket. A spring-loaded firing pin senses this, and sets off a stab sensitive primer near the detonator. This sets off the explosive train.

AFTER

BEFORE



Type of Literature: INFANTRY - TECHNICAL
Rewrite Problem(s):
LONG SENTENCES REMOTE REFERENCES
TOO WORDY REMOTE REFERENCES
CONFUSING
No. of 1 Syll. words/Total No. words: 198/350=57%
FORCAST Reading Grade Level Score: 11.4

HAND GRENADES

Section I. CHARACTERISTICS AND MAIN PARTS

[illegible]

Section II. FUZES AND HAND GRENADE SAFETY CLIP

6. Functioning
(fig. 1)

All fuzes in U.S. hand grenades may be categorized as either detonating or igniting. With few exceptions, fuzes function in the following manner:

a. When the safety pin is withdrawn from the fuze, the safety lever is released from the grenade body, but is held in place by the individual throwing the grenade or, if the grenade is rifle projected, by a grenade projection adapter. A hand grenade safety clip, adaptable for the M26-series, the M33-series, the M56, M57, and MK2 fragmentation grenades, and the M30 practice grenade has been designed to prevent the grenade safety lever from springing loose should the safety pin be unknowingly or accidentally removed from the grenade. Pressure exerted by the safety clip prevents the release of the grenade safety lever, regardless of whether the safety pin is in place.

(1) The safety clip (fig. 2) is a single piece of spring-steel wire bent to form—

(*a*) A metal *loop* whi
grenade fuze at the grenade n

(*b*) A metal *clamp* whi
presses against the grenade safe

(2) To attach the safety c
(fig. 3)—

(*a*) Slide the clip onto

(*b*) Attach the loop por
clip around the grenade fuze.

(*c*) Snap the clip end ar
safety lever.

Note The hand grenade s
issued attached to the above grenades,
as a separate item.

b. When the safety lever (fig.
is forced away from the grenade l
acting under the force of a strike

c. As the safety lever is forcec
grenade body, the striker rotate
strikes the primer.

d. When struck, the primer
flash of heat which ignites the

78

① WHEN SAFETY PIN IS WITHDRAWN, THE SAFETY LEVER IS FREE TO RELEASE FROM THE GRENADE BODY
② WHEN SAFETY LEVER IS RELEASED, STRIKER ROTATES ON AXIS TO STRIKE PRIMER.
③ WHEN PRIMER IS STRUCK, FLASH OF HEAT IGNITES DELAY ELEMENT
④ DELAY ELEMENT BURNS DOWN TO THE DETONATOR OR IGNITER.
⑤ DETONATOR OR IGNITER SETS OFF BURSTER OR MAIN CHARGE (FILLER)

Figure 1. Fuze functioning. (For details of the gr

e. The delay element burns for the prescribed delay time and thereupon initiates the detonator or igniter.

f. The detonator or igniter sets off the grenade's filler. Detonators are used in fragmentation, white phosphorous smoke, and bursting chemical hand grenades. Igniters are used with practice and burning chemical hand grenades.

[illegible]

TO APPLY SAFETY CLIP:

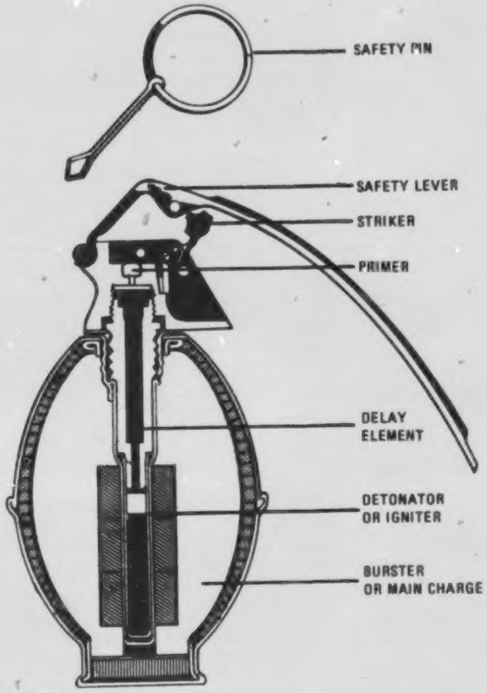
① SLIDE CLIP ON HANDLE
② ATTACH LOOP PORTION OF SAFETY CLIP AROUND THE GRENADE FUZE
③ SNAP CLIP END AROUND GRENADE HANDLE
IN PLACE

Figure 3. Attaching the hand grenade safety clip.

SECTION II. FUZES AND HAND GRENADE SAFETY CLIP

6. HOW THE FUSE IN A HAND GRENADE WORKS

1. The safety lever presses down against the striker and holds it in "safe" position. The safety pin locks the safety lever in this position.
2. When you pull the safety pin the safety lever is held in place only by your hand.
3. When you let go of the grenade the safety lever is flipped off by the striker. The striker continues forward and hits the primer.
4. When the primer is struck it gives off a flash of heat to ignite the delay element.
5. The delay element burns down to the detonator or igniter.
6. The detonator or igniter sets off the main charge which explodes the grenade.

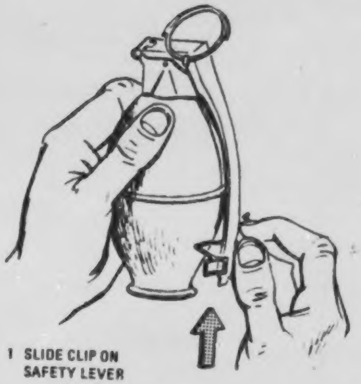


All the hand grenades you will use have either detonating or igniting fuses. Detonators are used in fragmentation, white phospherous smoke, and bursting chemical hand grenades. Igniters are used in practice grenades and in chemical hand grenades which burn instead of explode. Both types of fuse work the same in the grenade.

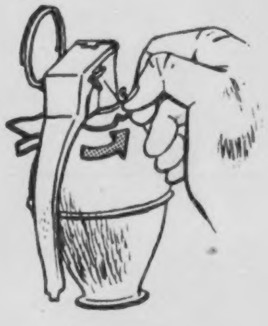
Type of Literature: INFANTRY - TECHNICAL

Primary User: WORKER
Information Objectives: HOW IT DOES IT -
HOW TO DO IT
No. of 1 Syll. words/Total No. words: 162/236=71%
FORCAST Reading Grade Level Score: 9.4

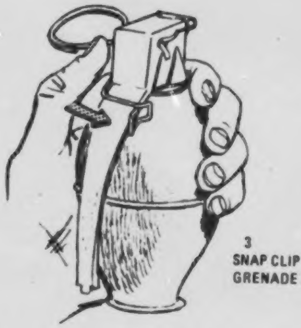
7. HOW TO PUT THE SAFETY CLIP ON A HAND GRENADE



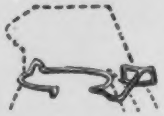
1 SLIDE CLIP ON SAFETY LEVER



2 ATTACH LOOP PORTION OF SAFETY CLIP AROUND THE GRENADE FUZE



3 SNAP CLIP END AROUND GRENADE SAFETY LEVER



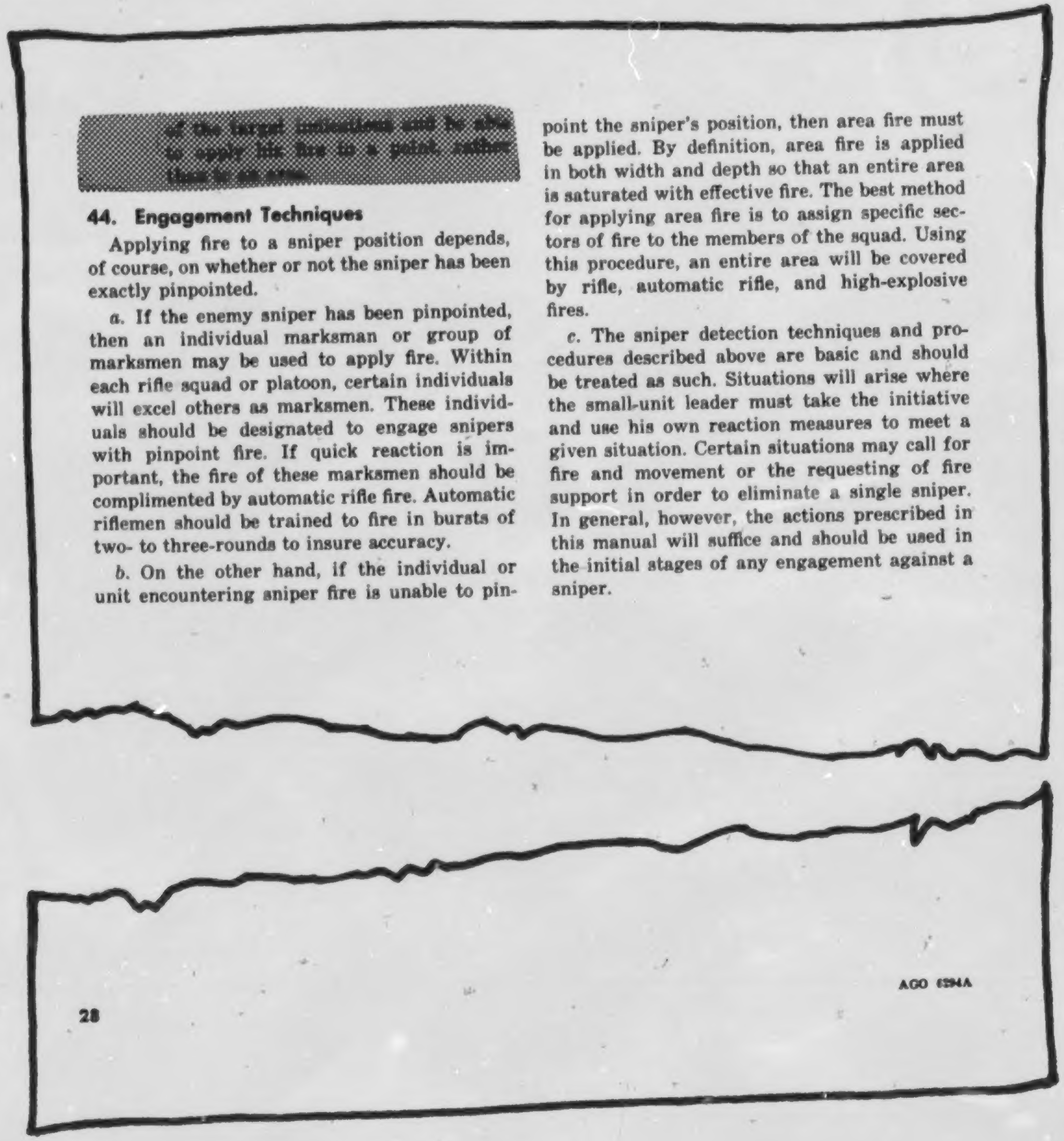
4 SAFETY CLIP IN PLACE

When the safety pin is pulled from the fuse, the grenade will go off unless something holds down the safety lever. A safety clip will do this. It is a piece of spring-steel wire, bent to form a loop and a clamp. To avoid accidents, use the hand grenade safety clip when you do not want to throw the grenade.

AFTER

Type of Literature: INFANTRY - COMBAT
Rewrite Problem(s):
HARD WORDS
TOO VAGUE
TOO WORDY
No. of 1 Syll. words/Total No. words: 151/265=57%
FORCAST Reading Grade Level Score: 11.4

BEFORE



of the target indicators and be able to apply his fire to a point, rather than to an area.

44. Engagement Techniques

Applying fire to a sniper position depends, of course, on whether or not the sniper has been exactly pinpointed.

a. If the enemy sniper has been pinpointed, then an individual marksman or group of marksmen may be used to apply fire. Within each rifle squad or platoon, certain individuals will excel others as marksmen. These individuals should be designated to engage snipers with pinpoint fire. If quick reaction is important, the fire of these marksmen should be complimented by automatic rifle fire. Automatic riflemen should be trained to fire in bursts of two- to three-rounds to insure accuracy.

b. On the other hand, if the individual or unit encountering sniper fire is unable to pinpoint the sniper's position, then area fire must be applied. By definition, area fire is applied in both width and depth so that an entire area is saturated with effective fire. The best method for applying area fire is to assign specific sectors of fire to the members of the squad. Using this procedure, an entire area will be covered by rifle, automatic rifle, and high-explosive fires.

c. The sniper detection techniques and procedures described above are basic and should be treated as such. Situations will arise where the small-unit leader must take the initiative and use his own reaction measures to meet a given situation. Certain situations may call for fire and movement or the requesting of fire support in order to eliminate a single sniper. In general, however, the actions prescribed in this manual will suffice and should be used in the initial stages of any engagement against a sniper.

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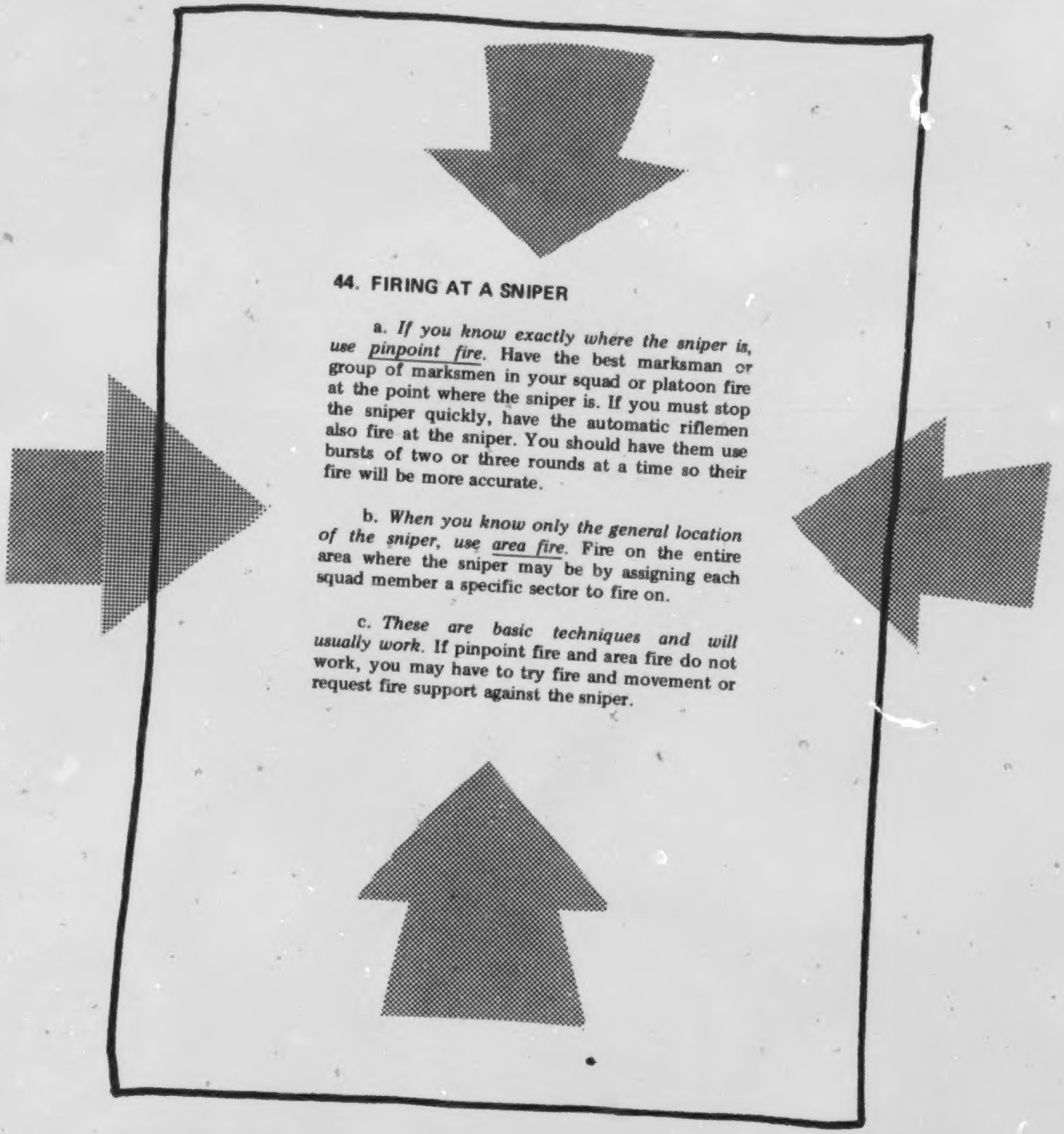


44. FIRING AT A SNIPER

a. *If you know exactly where the sniper is, use pinpoint fire.* Have the best marksman or group of marksmen in your squad or platoon fire at the point where the sniper is. If you must stop the sniper quickly, have the automatic riflemen also fire at the sniper. You should have them use bursts of two or three rounds at a time so their fire will be more accurate.

b. *When you know only the general location of the sniper, use area fire.* Fire on the entire area where the sniper may be by assigning each squad member a specific sector to fire on.

c. *These are basic techniques and will usually work.* If pinpoint fire and area fire do not work, you may have to try fire and movement or request fire support against the sniper.

Type of Literature: **INFANTRY - COMBAT**

Primary User: **DIRECT SUPERVISOR**
Information Objectives: **WHAT TO DO**

No. of 1 Syll. words/Total No. words: **101/139=72%**
FORCAST Reading Grade Level Score: **9.2**

AFTER

Type of Literature: INFANTRY - COMBAT
Rewrite Problem(s):
HARD WORDS WEAK VISUAL AIDS
CONFUSING RUN-TOGETHER FORMAT
REMOTE REFERENCE
No. of 1 Syll. words/Total No. words: 128/217=59%
FORCAST Reading Grade Level Score: 11.1

BEFORE

position are made prior to the attack and adjusted as the situation dictates. Immediately after seizing the objective, the squad prepares to repel a possible counterattack. Security is posted to warn of the enemy approach. The squad leader, assisted by the fire team leaders, assigns individual positions and sectors of fire. In addition, automatic riflemen and grenadiers are assigned principal directions of fire covering critical approaches. Men dig in immediately.

(2) *Reorganization.* Reorganization is a continuing process. It is given special emphasis upon seizure of the objective. During the attack the squad will have received casualties, expended ammunition, and perhaps lost equipment. Key men who have become casualties are replaced. Ammunition is redistributed within the squad. Casualties are placed in a covered position while awaiting evacuation. Lost or damaged equipment is replaced or requested.

28. Control Measures

Control measures used during a daylight attack are graphically represented in figure 11.

29. Fire and Movement
(fig. 12)

When fire and movement are used, effective fire and skillful movement must go hand-in-hand. The ability of the squad to achieve one without the other is insufficient. Failure or refusal to have someone moving forward loses the initiative and momentum and may result in the methodical destruction of the squad. Movement without effective fire is equally disastrous. It is important that fire and movement be executed instinctively and with swift precision.

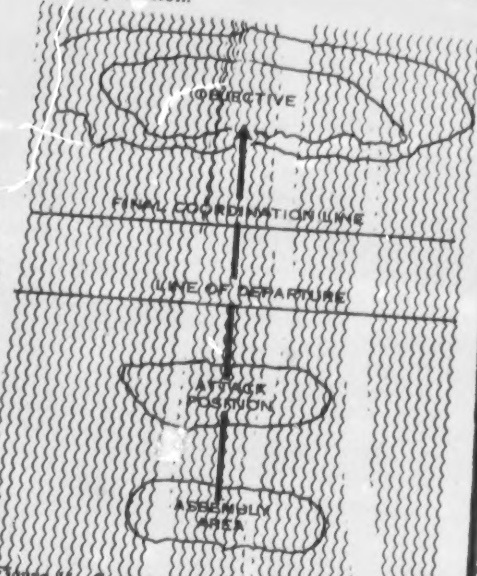


Figure 11. Control measures used during a daylight attack.

a. By Individuals. Individual fire and movement is the most effective way for the rifle squad to advance under intense enemy fire. A minimum number of personnel (one per fire team) move forward in turn under cover of a maximum amount of aimed fire. Squad members rush forward 10–15 meters when it is their turn, keeping as low as possible. The rush should not be long enough to allow the enemy to shift his aim and fire. When moving, squad members should not take time to fire unless they encounter close-in enemy. When firing to cover moving squad members, the squad maintains a volume of well-aimed fire at known and suspected enemy locations. Fire distribution during individual fire and movement is the same as that used during the assault (para 41). Thorough training in individual fire and movement is of primary importance.

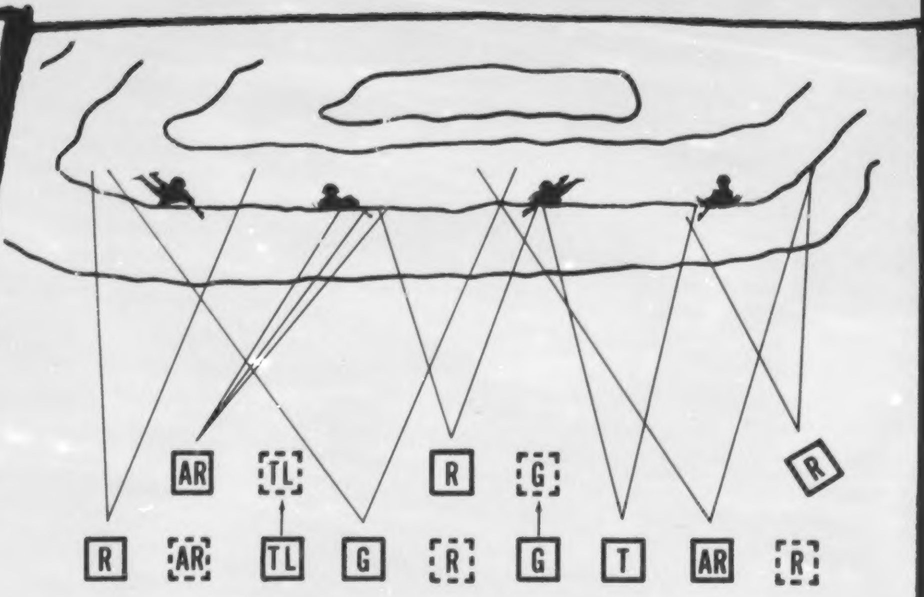


Figure 12. Fire and movement.

b. By Fire Teams. Fire team fire and movement may be used when enemy fire is light but sufficiently heavy to prevent an assault; or it may develop from individual fire and movement as the effectiveness of enemy fire decreases. The roles of fire support and movement alternate between the two teams as they "leapfrog" forward. The fire support element maintains a volume of well-aimed fire on known and suspected enemy locations. It initiates fire on enemy elements creating the greatest danger to the movement and then distributes its fire over other known and suspected enemy locations.

30. Fire and Maneuver
(fig. 13)

The rifle squad uses fire and maneuver when it encounters an isolated enemy position such as an outpost or a sniper. Ideally, good fields of fire would be available for use by the base-of-fire element and a covered or concealed route would be available to the maneuver element.

a. Organization for Fire and Maneuver.

(1) The rifle squad is organized into a base-of-fire element and a maneuver element. Each of these elements has a distinct and separate mission.

(2) The organization of the squad into two fire teams does not prevent the squad leader from organizing his maneuver and base-of-fire elements to conform to a specific situation. For example, when more firepower is required in the base-of-fire element than can be provided by one fire team, the squad leader may designate the automatic riflemen, grenadiers, and one of the fire team leaders as the base-of-fire element. The remainder of the squad then becomes the maneuver element. However, such a subdivision takes time to accomplish and the squad loses its tactical integrity and some of its flexibility.

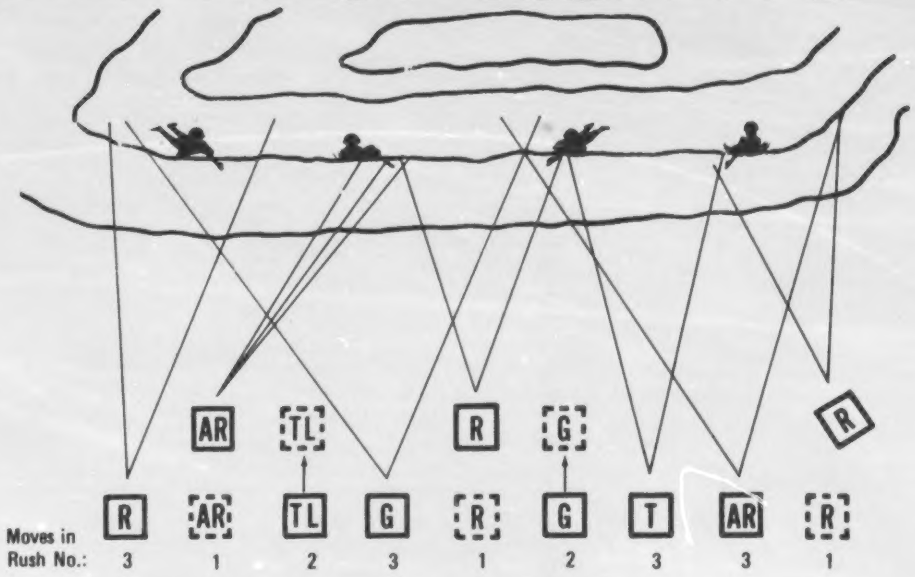


Figure 12. Fire and movement.

29. FIRE AND MOVEMENT

At times a rifle squad must advance even though it is under enemy fire. To do so, it moves forward by a method called *fire and movement.* The squad moves forward in small but rapid steps. At each step part of the squad rushes forward while the rest of the squad covers them with heavy fire aimed at the enemy. When the enemy fire is heavy, only a few individuals move forward at a time. When the enemy fire is light, an entire fire team moves forward at one time.

a. *Individual fire and movement*

When the enemy fire is heavy, only a few men move forward in each rush, usually one man from each fire team. The rest of the squad covers them as they move. The men in the squad move forward in turns, so that gradually the entire squad moves up. Figure 12 shows what the pattern of movement looks like in individual fire and movement.

As a member of the squad, you must do your part well both when you rush forward and when you cover the men who are moving. The squad must work together or the enemy fire may destroy it.

When you move forward:

(1) Move fast.

(2) Go about 10 to 15 meters. Do not go long enough for the enemy to have time to shift aim and fire at you.

(3) Keep as low as you can.

(4) Do not fire unless you meet the enemy at short range.

When you cover the men who are moving:

(1) Fire as fast as you can at the location where you know or think the enemy is.

(2) Fire at the same sector or target as you would in an assault. Team leaders and riflemen concentrate on the targets nearest to their immediate front. Automatic riflemen and grenadiers concentrate on hitting supporting weapons.

Type of Literature: INFANTRY - COMBAT

Primary User: WORKER
Information Objectives: WHAT TO DO

No. of 1 Syll. words/Total No. words: 231/306=75%
FORCAST Reading Grade Level Score: 8.8

A
F
T
E
R

BEFORE

Type of Literature: INFANTRY - COMBAT
Rewrite Problem(s):
HARD WORDS WEAK VISUAL AIDS
LONG SENTENCES
REMOTE REFERENCES
No. of 1 Syll. words/Total No. words: 92/167=55%
FORCAST Reading Grade Level Score: 11.7

Section III. FUNCTIONING AND INSTALLATION

11. Functioning

a. Electrical Firing. When the M18A1 is armed, actuating the M57 firing device handle (fig. 5) with the safety bail in the FIRE position provides sufficient electrical energy to detonate the M6 electric blasting cap. The detonation of the blasting cap, in turn, sets off the high explosive charge (composition C4). Detonation of the high explosive charge causes fragmentation of the plastic matrix and projects spherical steel fragments outward in a fan-shaped pattern (fig. 4). This mine is sufficiently waterproof to function satisfactorily after having been submerged in salt or fresh water for 2 hours.

b. Nonelectrical Firing. The M18A1 mine is deliberately detonated by the operator pulling or cutting a tripwire attached to a nonelectrical firing device (fig. 9). A nonelectric blasting cap attached to the firing device and crimped to a length of detonating cord sets off the detonating cord. At the other end of the detonating cord, a second crimped nonelectric blasting cap, which is inserted in one of the detonator wells, detonates the mine.

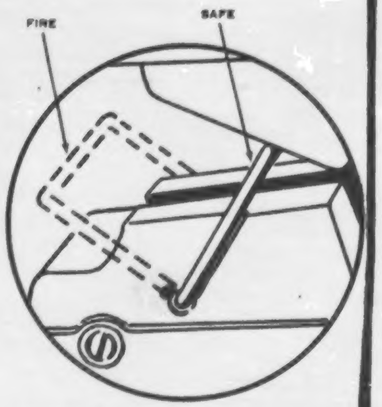


Figure 5. The M57 firing device safety bail.

12. Installation for Electrical Firing

a. Laying and Aiming.

(1) Remove the mine and accessories (fig. 2) from the bandoleer. Read the instruction sheet (fig. 3) attached to the flap of the bandoleer before proceeding with the installation of the mine.

(2) *The M57 firing device must be in the possession of the individual installing the mine. This prevents accidental firing by a second individual.*

(3) Turn the legs downward and spread them about 45° apart. Twist both pairs of legs so that one leg protrudes ahead and one behind the mine, and position the mine so that the surface marked FRONT TOWARD ENEMY and the arrows on top of the case point in the direction of the enemy or the desired area of fire. On snow or extremely soft ground (mud), the bandoleer may be spread beneath the mine for support. To prevent the mine from tipping in windy areas, or when the legs cannot be pressed into the ground, carefully spread the legs to the maximum width (approximately 180°) so that the legs will be to the front and rear of the mine. A top view of the M18A1 antipersonnel mine is shown in figure 10.

(4) Select an aiming point (tree, bush, etc.) that is approximately 150 feet from the mine and which projects approximately 8 feet above the ground (fig. 11). This approximates 2½ meters at a distance of 50 meters. Position the eye approximately 6 inches (15 cm) away from the mine and aim the mine by sighting through the peepsight. The groove of the sight should be in line with the aiming point. The aiming point should be in the center of the desired area of coverage, and the bottom edge of the peepsight should be parallel to the ground that is to be covered with the fragment spray.

b. Arming and Electrical Firing.

(1) Unscrew either the right or left shipping plug priming-adapter, and reverse it to allow the firing wire to be placed into the slot provided in the priming-adapter portion (fig. 12). Remove the insulation tape and unroll the paper form from the firing wire. Make sure that the firing wire is uncoiled without tangling or kinking. Retain the paper form and the tape for possible future use. Hold the blasting cap while unwinding approximately 3 meters of the firing wire. Make certain that the combination shorting plug and dust cover are

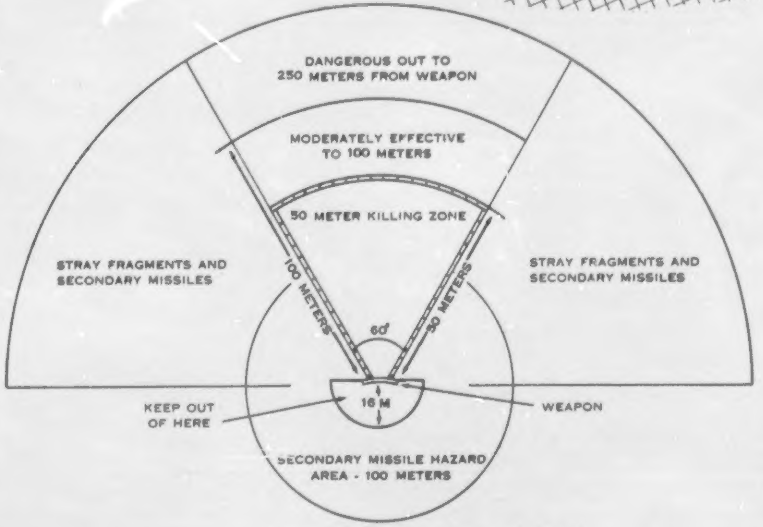


Figure 4. Danger radius and effects of the M18A1.

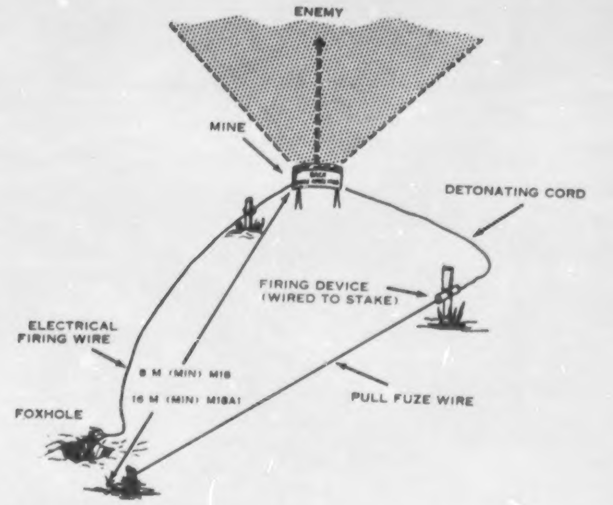


Figure 9. Diagram of the M18A1 antipersonnel mine installed for controlled nonelectrical and electrical detonation.

Section III. FUNCTIONING AND INSTALLATION

11. How it works

This mine will work even after it has been in salt or fresh water for up to 2 hours. There is a high explosive charge inside the M18A1 mine. When you set off this charge, the plastic case of the mine breaks. Small round pieces of steel fly outward in a fan-shaped pattern. This pattern is shown in Figure 1.

You can use either electrical or nonelectrical firing to set off the mine. Figure 2 shows you how each kind of firing works.

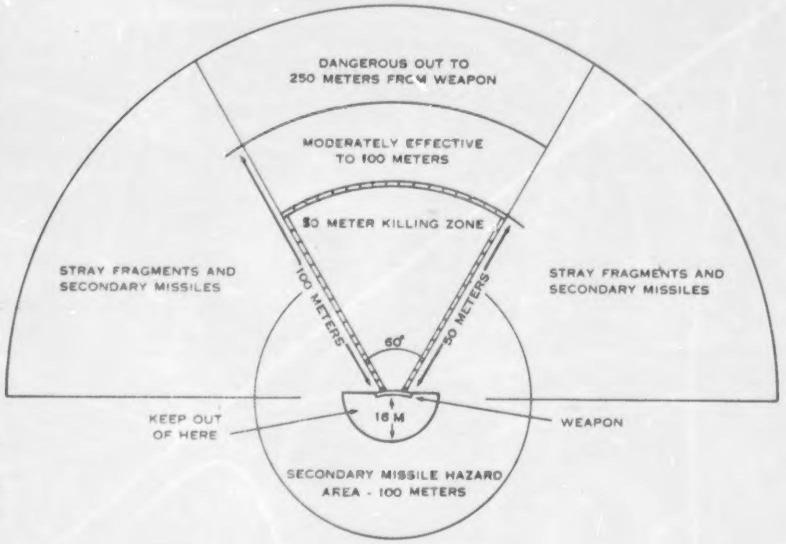
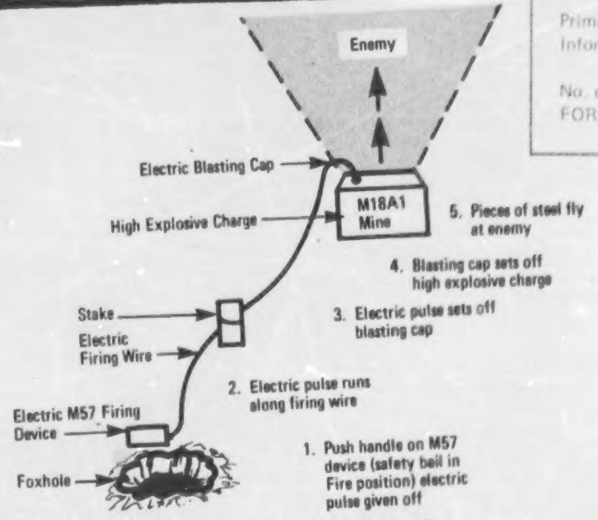


Figure 1. Danger radius and effects of the M18A1.

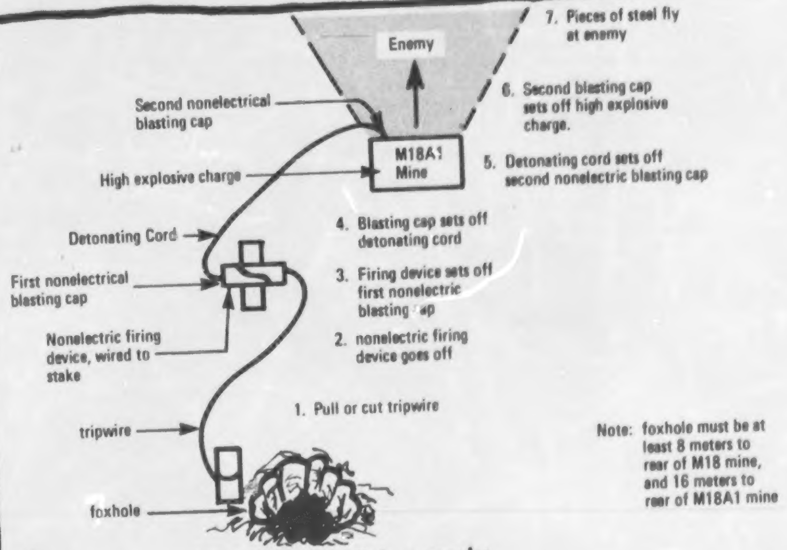
Type of Literature: **INFANTRY - COMBAT**

Primary User: **WORKER**
Information Objectives: **HOW IT DOES IT**

No. of 1 Syll. words/Total No. words: **67/86=78%**
FORCAST Reading Grade Level Score: **8.3**


Enemy
Electric Blasting Cap
High Explosive Charge
M18A1 Mine
5. Pieces of steel fly at enemy
4. Blasting cap sets off high explosive charge
Stake
Electric Firing Wire
3. Electric pulse sets off blasting cap
2. Electric pulse runs along firing wire
Electric M57 Firing Device
Foxhole
1. Push handle on M57 device (safety bail in Fire position) electric pulse given off

A. How electrical mine firing works


Enemy
7. Pieces of steel fly at enemy
Second nonelectrical blasting cap
6. Second blasting cap sets off high explosive charge.
M18A1 Mine
High explosive charge
5. Detonating cord sets off second nonelectric blasting cap
Detonating Cord
4. Blasting cap sets off detonating cord
First nonelectrical blasting cap
3. Firing device sets off first nonelectric blasting cap
Nonelectric firing device, wired to stake
2. nonelectric firing device goes off
1. Pull or cut tripwire
tripwire
foxhole
Note: foxhole must be at least 8 meters to rear of M18 mine, and 16 meters to rear of M18A1 mine

B. How nonelectrical mine firing works

Figure 2. Electrical and Nonelectrical Firing of Claymore Mine

AFTER

Type of Literature: INFANTRY - COMBAT
Rewrite Problem(s):
HARD WORDS TOO WORDY
LONG SENTENCES CONFUSING
TOO VAGUE
No. of 1 Syll. words/Total No. words: 441/800=55%
FORCAST Reading Grade Level Score: 11.7

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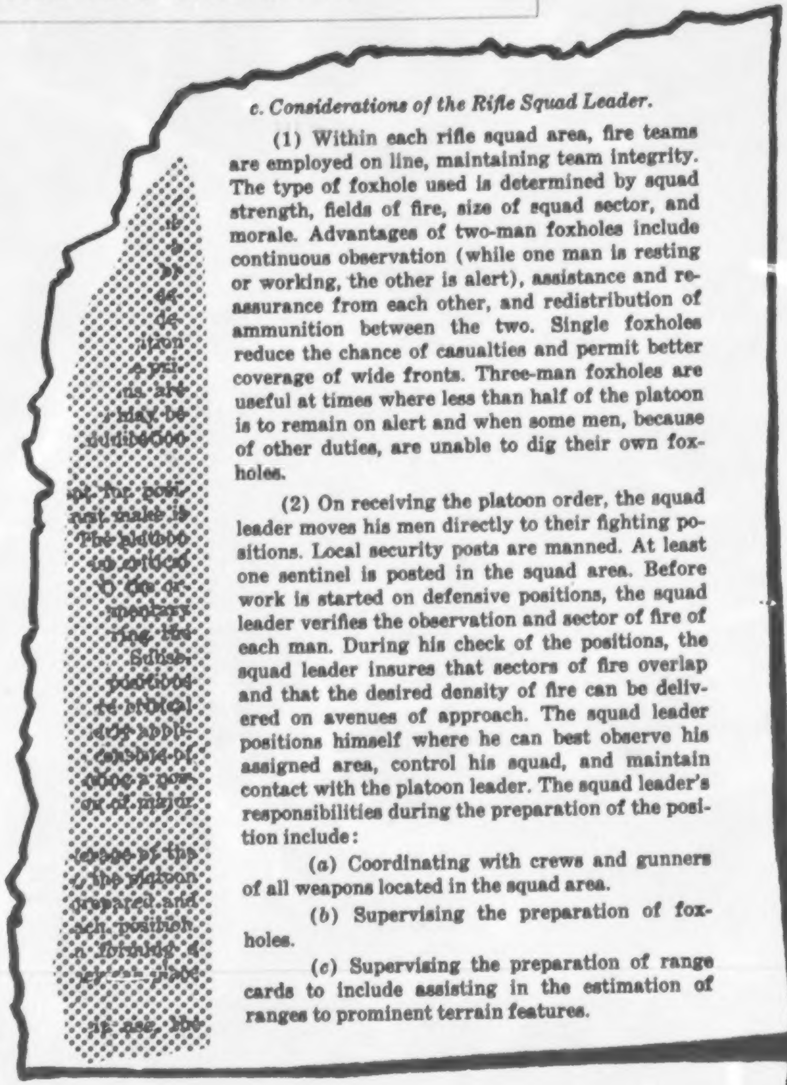


c. Considerations of the Rifle Squad Leader.

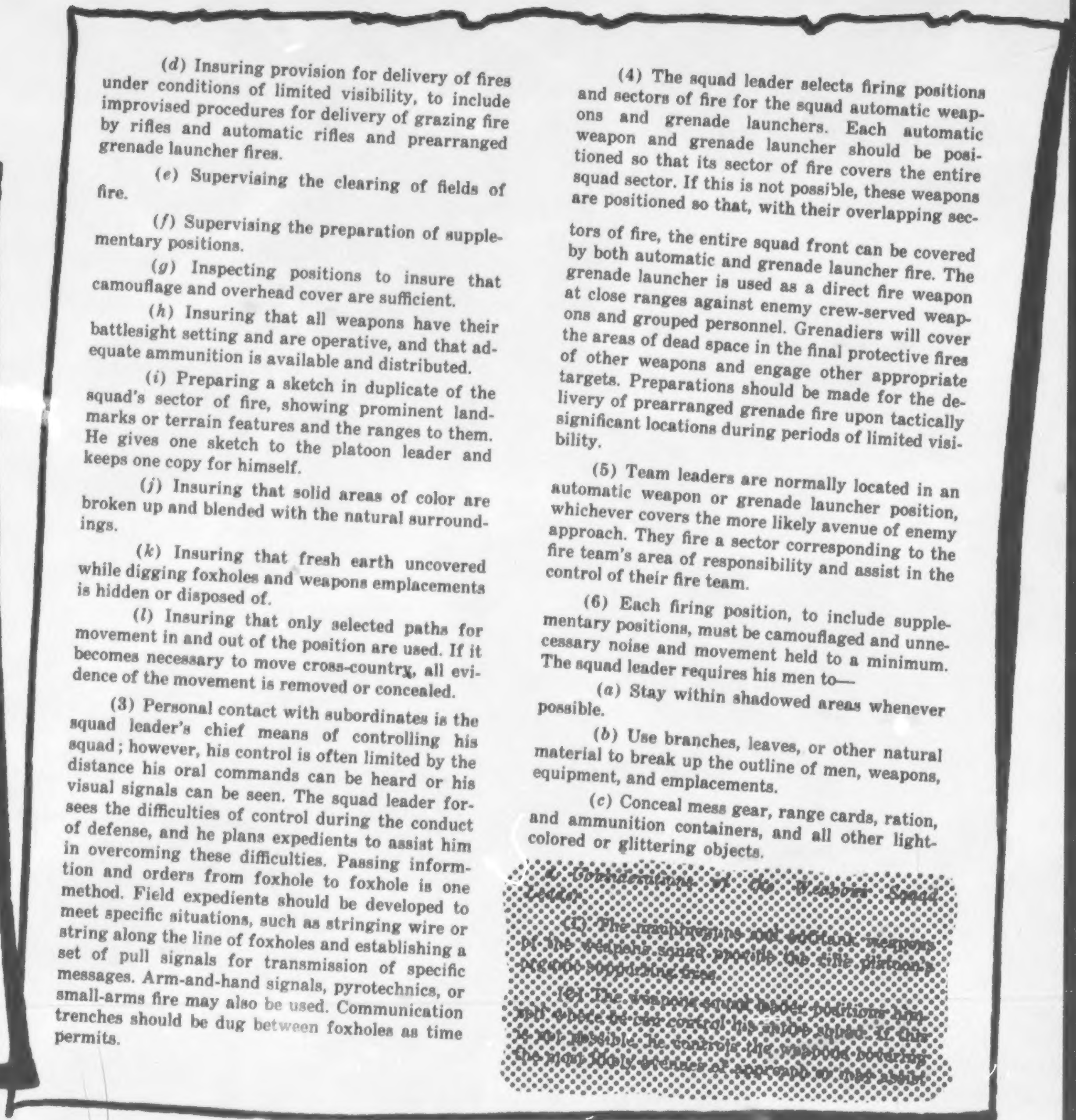
(1) Within each rifle squad area, fire teams are employed on line, maintaining team integrity. The type of foxhole used is determined by squad strength, fields of fire, size of squad sector, and morale. Advantages of two-man foxholes include continuous observation (while one man is resting or working, the other is alert), assistance and reassurance from each other, and redistribution of ammunition between the two. Single foxholes reduce the chance of casualties and permit better coverage of wide fronts. Three-man foxholes are useful at times where less than half of the platoon is to remain on alert and when some men, because of other duties, are unable to dig their own foxholes.

(2) On receiving the platoon order, the squad leader moves his men directly to their fighting positions. Local security posts are manned. At least one sentinel is posted in the squad area. Before work is started on defensive positions, the squad leader verifies the observation and sector of fire of each man. During his check of the positions, the squad leader insures that sectors of fire overlap and that the desired density of fire can be delivered on avenues of approach. The squad leader positions himself where he can best observe his assigned area, control his squad, and maintain contact with the platoon leader. The squad leader's responsibilities during the preparation of the position include:

(*a*) Coordinating with crews and gunners of all weapons located in the squad area.

(*b*) Supervising the preparation of foxholes.

(*c*) Supervising the preparation of range cards to include assisting in the estimation of ranges to prominent terrain features.



(*d*) Insuring provision for delivery of fires under conditions of limited visibility, to include improvised procedures for delivery of grazing fire by rifles and automatic rifles and prearranged grenade launcher fires.

(*e*) Supervising the clearing of fields of fire.

(*f*) Supervising the preparation of supplementary positions.

(*g*) Inspecting positions to insure that camouflage and overhead cover are sufficient.

(*h*) Insuring that all weapons have their battlesight setting and are operative, and that adequate ammunition is available and distributed.

(*i*) Preparing a sketch in duplicate of the squad's sector of fire, showing prominent landmarks or terrain features and the ranges to them. He gives one sketch to the platoon leader and keeps one copy for himself.

(*j*) Insuring that solid areas of color are broken up and blended with the natural surroundings.

(*k*) Insuring that fresh earth uncovered while digging foxholes and weapons emplacements is hidden or disposed of.

(*l*) Insuring that only selected paths for movement in and out of the position are used. If it becomes necessary to move cross-country, all evidence of the movement is removed or concealed.

(3) Personal contact with subordinates is the squad leader's chief means of controlling his squad; however, his control is often limited by the distance his oral commands can be heard or his visual signals can be seen. The squad leader foresees the difficulties of control during the conduct of defense, and he plans expedients to assist him in overcoming these difficulties. Passing information and orders from foxhole to foxhole is one method. Field expedients should be developed to meet specific situations, such as stringing wire or string along the line of foxholes and establishing a set of pull signals for transmission of specific messages. Arm-and-hand signals, pyrotechnics, or small-arms fire may also be used. Communication trenches should be dug between foxholes as time permits.

(4) The squad leader selects firing positions and sectors of fire for the squad automatic weapons and grenade launchers. Each automatic weapon and grenade launcher should be positioned so that its sector of fire covers the entire squad sector. If this is not possible, these weapons are positioned so that, with their overlapping sectors of fire, the entire squad front can be covered by both automatic and grenade launcher fire. The grenade launcher is used as a direct fire weapon at close ranges against enemy crew-served weapons and grouped personnel. Grenadiers will cover the areas of dead space in the final protective fires of other weapons and engage other appropriate targets. Preparations should be made for the delivery of prearranged grenade fire upon tactically significant locations during periods of limited visibility.

(5) Team leaders are normally located in an automatic weapon or grenade launcher position, whichever covers the more likely avenue of enemy approach. They fire a sector corresponding to the fire team's area of responsibility and assist in the control of their fire team.

(6) Each firing position, to include supplementary positions, must be camouflaged and unnecessary noise and movement held to a minimum. The squad leader requires his men to—

(*a*) Stay within shadowed areas whenever possible.

(*b*) Use branches, leaves, or other natural material to break up the outline of men, weapons, equipment, and emplacements.

(*c*) Conceal mess gear, range cards, ration, and ammunition containers, and all other light-colored or glittering objects.

Type of Literature: **INFANTRY - COMBAT**

Primary User: **DIRECT SUPERVISOR**
Information Objectives: **WHAT TO DO**

No. of 1 Syll. words/Total No. words: **439/611=72%**
FORCAST Reading Grade Level Score: **9.2**

c. ***Duties of the rifle squad leader in the forward defense area.***

Each rifle squad is made up of fire teams. The rifle squad leader is in charge of these teams. He is responsible for their security, positions and fire. When he gets the platoon order, the squad leader moves his men into their fighting positions. He takes charge of these activities:

(1) *Security.*

(a) Sees that sentries man the local security posts.

(b) Posts at least one sentry in the squad area.

(2) *Fire.*

(a) Checks the observation and sector fire of each of the men *before* they start to work on defensive positions.

(b) Makes sure that the sectors of fire overlap.

(c) Makes sure that enough fire can be turned to areas where the enemy is likely to come from.

(d) Sets up a plan for fire when visibility is low.

(e) Makes sure that the fields of fire are cleared.

(3) *Positions.*

Picks the type and position of the squad's foxholes and any other positions.

(a) Uses 1-man foxhole to:
  Lower chance of casualties
  Cover wide fronts
(b) Uses 2-man foxhole to:
  Get continuous observation (one man alert at all times)
  Let the men help and reassure each other
  Share the ammunition.
(c) Uses 3-man foxhole when:
  Less than half the squad must be alert
  Some men have duties which keep them from digging their own fox holes.

(4) *Assigns men and weapons to positions.*

(a) Puts each automatic weapon and grenade launcher so that its sector of fire covers the whole squad sector. If this cannot be done, he puts them so that their sectors of fire overlap to cover the whole squad front with both automatic and grenade launcher fire.

(b) Puts the grenadiers so that their fire will cover the gaps in the fire of other weapons and will cover targets such as groups of enemy soldiers and weapons served by crews.

(c) Puts the team leaders in positions held by an automatic weapon or a grenade launcher which covers the area the enemy will probably come from. The team leaders fire the same sector as their fire team and help control the team.

(d) Takes a position where he can best watch the area assigned to him. From this position, he must also be able to control his squad and to be in touch with the platoon leader.

(5) *Weapons*

(a) Makes sure that all weapons have their battlesight setting and can fire.

(b) Makes sure each weapon has enough ammunition.

(c) Coordinates with the crews and gunners of all the weapons in his squad area.

(6) *Range cards.*

(a) Supervises the preparation of range cards.

(b) Helps his men figure the range to landmarks in their area.

(c) Makes a sketch of his squad's sector of fire. The sketch shows landmarks and the ranges to them.

(d) Makes two copies of the sketch. He keeps one copy, and gives one to the platoon leader.

(7) Camouflage.

Makes sure that all men, weapons, and positions are camouflaged. He sees that *his men:*

(a) Break up solid areas of cover to blend with the natural surroundings.

(b) Hide or get rid of fresh dirt from diggings.

(c) Move in and out of their positions on paths which he sets up.

(d) Do not make unnecessary noise.

(e) Stay in shadows as much as they can.

(f) Break up outlines with branches, leaves, or other natural material.

(g) Hide all objects that are light in color or that might reflect light.

(h) If his squad must move cross-country, the squad leader hides their trail.

(8) *Communications.*

(a) Sets up a good way to communicate with his men when under fire. Ways include:
  A set of pull signals on wire strung between the foxholes.
  Signals with arm and hand.
  Pyrotechnics.
  Small-arms fire.

(b) If he has time, he has his men dig communication trenches between foxholes.

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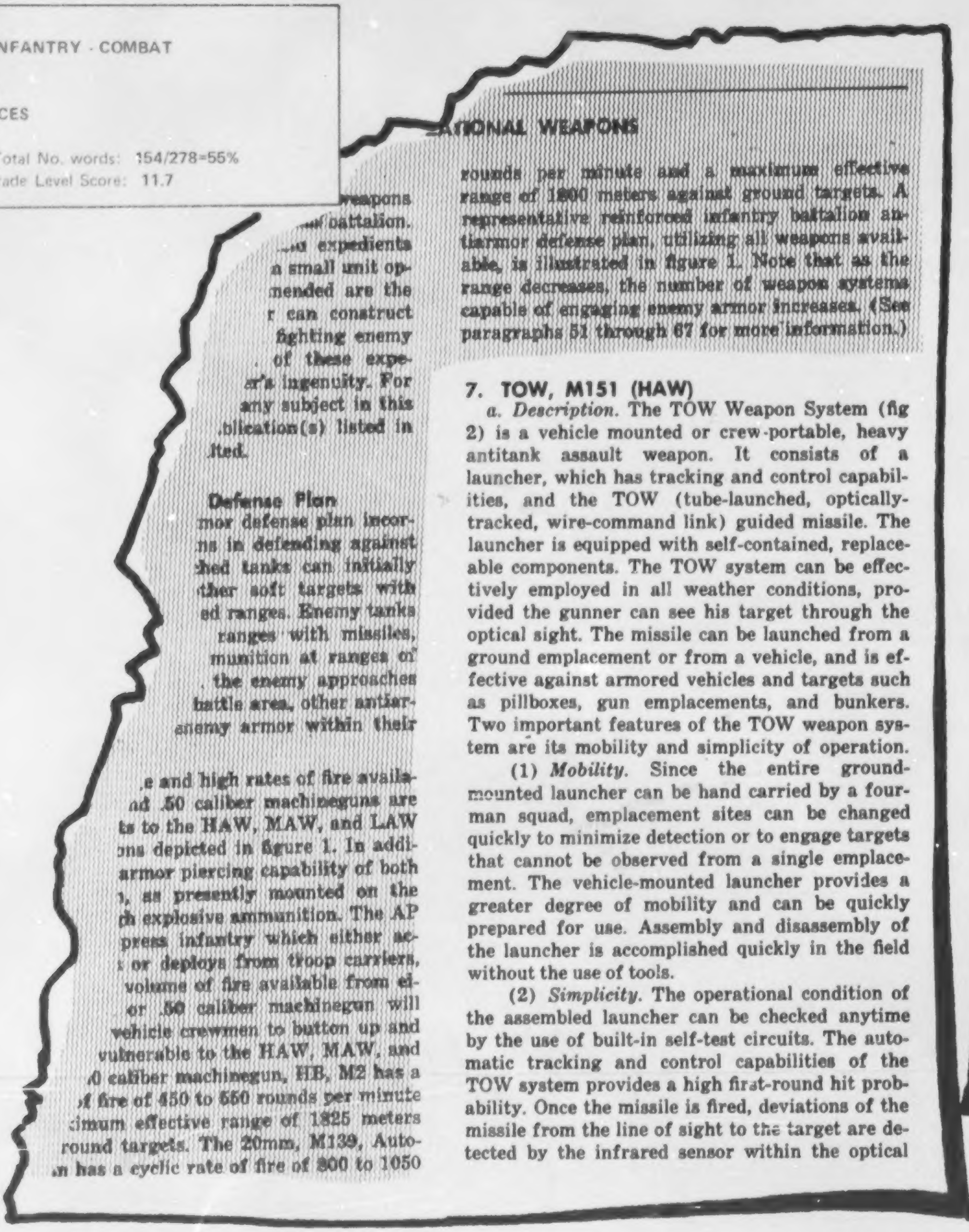
Type of Literature: **INFANTRY - COMBAT**
Rewrite Problem(s):
HARD WORDS
LONG SENTENCES
NOT DIRECT
No. of 1 Syll. words/Total No. words: 154/278=55%
FORCAST Reading Grade Level Score: 11.7

BEFORE



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or deploys from troop carriers,
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vulnerable to the HAW, MAW, and
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f fire of 450 to 550 rounds per minute
imum effective range of 1825 meters
round targets. The 20mm, M139, Auto-
n has a cyclic rate of fire of 800 to 1050

rounds per minute and a maximum effective range of 1800 meters against ground targets. A representative reinforced infantry battalion antiarmor defense plan, utilizing all weapons available, is illustrated in figure 1. Note that as the range decreases, the number of weapon systems capable of engaging enemy armor increases. (See paragraphs 51 through 67 for more information.)

7. TOW, M151 (HAW)

a. Description. The TOW Weapon System (fig 2) is a vehicle mounted or crew-portable, heavy antitank assault weapon. It consists of a launcher, which has tracking and control capabilities, and the TOW (tube-launched, optically-tracked, wire-command link) guided missile. The launcher is equipped with self-contained, replaceable components. The TOW system can be effectively employed in all weather conditions, provided the gunner can see his target through the optical sight. The missile can be launched from a ground emplacement or from a vehicle, and is effective against armored vehicles and targets such as pillboxes, gun emplacements, and bunkers. Two important features of the TOW weapon system are its mobility and simplicity of operation.

(1) *Mobility.* Since the entire ground-mounted launcher can be hand carried by a four-man squad, emplacement sites can be changed quickly to minimize detection or to engage targets that cannot be observed from a single emplacement. The vehicle-mounted launcher provides a greater degree of mobility and can be quickly prepared for use. Assembly and disassembly of the launcher is accomplished quickly in the field without the use of tools.

(2) *Simplicity.* The operational condition of the assembled launcher can be checked anytime by the use of built-in self-test circuits. The automatic tracking and control capabilities of the TOW system provides a high first-round hit probability. Once the missile is fired, deviations of the missile from the line of sight to the target are detected by the infrared sensor within the optical

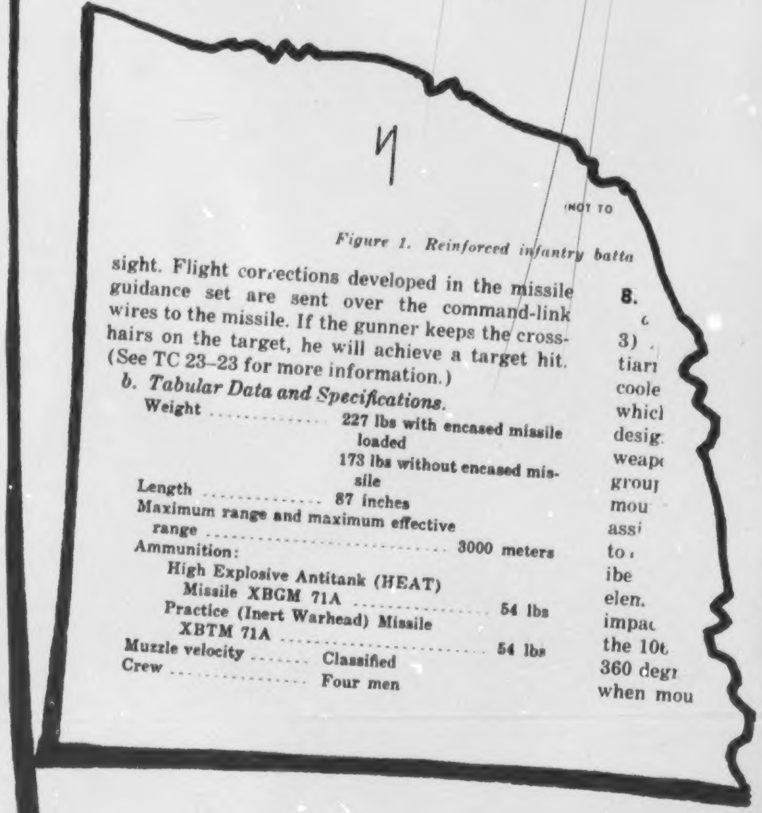

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Figure 1. Reinforced infantry batta

sight. Flight corrections developed in the missile guidance set are sent over the command-link wires to the missile. If the gunner keeps the cross-hairs on the target, he will achieve a target hit. (See TC 23–23 for more information.)

b. Tabular Data and Specifications.

Weight	227 lbs with encased missile loaded 173 lbs without encased missile
Length	87 inches
Maximum range and maximum effective range	3000 meters
Ammunition:	
High Explosive Antitank (HEAT) Missile XBGM 71A	54 lbs
Practice (Inert Warhead) Missile XBTM 71A	54 lbs
Muzzle velocity	Classified
Crew	Four men

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Type of Literature: INFANTRY - COMBAT

Primary User: DIRECT SUPERVISOR
Information Objectives: WHAT IT IS - HOW IT'S USED

No. of 1 Syll. words/Total No. words: 190/275=69%
FORCAST Reading Grade Level Score: 9.7

7. TOW, M151 (HAW)

The TOW Weapon System is an antitank assault weapon. It is made up of the TOW (tube-launched, optically-tracked, wire-command link) guided missile, and a launcher. The missile can be fired from a ground emplacement or from a vehicle. The launcher tracks and controls the missile after it is fired. The missile can be fired effectively against armored vehicles and targets such as pillboxes, gun emplacements, and bunkers.

The TOW system is easy to move and easy to use:

(1) Ease of moving: A squad of four men can carry the TOW system by hand and put it together or take it apart without the use of tools. This means that you can change launch sites quickly to avoid being spotted by the enemy or to get into a better position. You can also mount the system on a vehicle for quick moves over longer distances.

(2) Ease of use: The TOW system is easy to check in the field and easy to fire. The assembled launcher has self-test circuits built into it. These can be used at any time to check the operation of the launcher. To fire the missile, you just place the crosshairs of the sight on the target. Keep them there until the missile hits the target. The tracking and guidance system of the launcher keeps the missile on course so you do not have to correct for wind, lead or elevation. You can use the TOW system in any kind of weather. As long as you can see the target, you can hit it.

(**Note**: See TC 23-23 for more information on the system.)

Tabular Data and Specifications.

Weight	227 lbs with encased missile loaded 173 lbs without encased missile
Length	87 inches
Maximum range and maximum effective range	3000 meters
Ammunition:	
High Explosive Antitank (HEAT) Missile XBGM 71A	54 lbs
Practice (Inert Warhead) Missile XBTM 71A	54 lbs
Muzzle velocity	Classified
Crew	Four men

6. Battalion Antiarmor Defense Plan

a. The battalion antiarmor defense plan incorporates all available means in defending against enemy armor. Our attached tanks can initially engage personnel and other soft targets with their main guns at extended ranges. Enemy tanks are engaged at extended ranges with missiles, and with conventional ammunition at ranges of 2000 meters and less. As the enemy approaches the forward edge of the battle area, other antiarmor weapons engage enemy armor within their range capabilities.

b. The long range and high rates of fire available with 20mm and .50 caliber machineguns are ideal complements to the HAW, MAW, and LAW antiarmor weapons depicted in figure 1. In addition to the light armor piercing capability of both guns, the 20mm, as presently mounted on the M114A1, has high explosive ammunition. The AP or HE will suppress infantry which either accompanies tanks or deploys from troop carriers, while the heavy volume of fire available from either the 20mm or .50 caliber machinegun will cause armored vehicle crewmen to button up and become more vulnerable to the HAW, MAW, and LAW. The .50 caliber machinegun, HB, M2 has a cyclic rate of fire of 450 to 550 rounds per minute and a maximum effective range of 1825 meters against ground targets. The 20mm, M139, Automatic Gun has a cyclic rate of fire of 800 to 1050

A F T E R

Type of Literature: MEDIC - TECHNICAL
Rewrite Problem(s):
HARD WORDS
RUN-TOGETHER FORMAT

No. of 1 Syll. words/Total No. words: 107/174=61%
FORCAST Reading Grade Level Score: 10.8

B E F O R E

(5) A pneumatic splint (fig 4–3) is inflatable and made of transparent plastic. You blow air into it by mouth to get the necessary rigidity. Do not use any other means for inflation (such as a tank of compressed air). The splint requires no padding and it can be inflated or deflated as desired. The splint should not be inflated and left on the patient more than 30 minutes at a time. To do so will interfere with peripheral circulation. Reduction of peripheral circulation for a long time causes tissue anoxia, which in turn results in damaged or necrotic tissue. Tissue damage is proportional to the duration of diminished peripheral circulation and the degree of tissue anoxia. Therefore, if the patient must wear a pneumatic splint for an extended time, partially deflate it every 20 to 30 minutes for a few moments to reestablish peripheral circulation if it appears that the blood supply to the extremity has been impaired. Do not use these splints unless you have time to check the patient every few minutes.

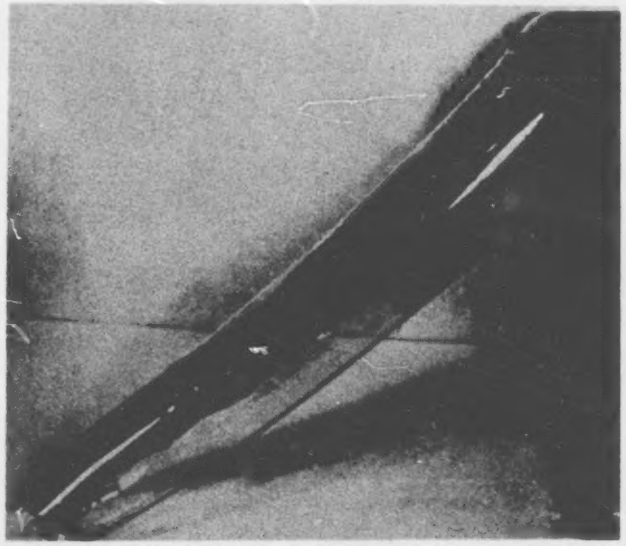

Figure 4–3. Inflated pneumatic splint applied on a patient's arm.

TYPES OF SPLINTS

(1) The pneumatic splint is blown up with air after being put on the patient's limb. It is made of clear plastic so you can see the patient's limb at all times. You do not need any padding when you use this splint. (See Figure 4-3.) You should blow up the splint only by mouth. Do not use any other means to blow it up.

CAUTION: Do not leave this splint on the patient for more than 30 minutes. It reduces the flow of blood to the limb. This lack of blood can cause tissue damage in the limb. If you must leave the splint on for more than 30 minutes, be sure to check the patient every 20 to 30 minutes. Let air out of the splint until it gets soft. Wait a few minutes for the blood to return to the limb. Then blow up the splint again with your mouth. Do not use this splint unless you have time to check the patient often.

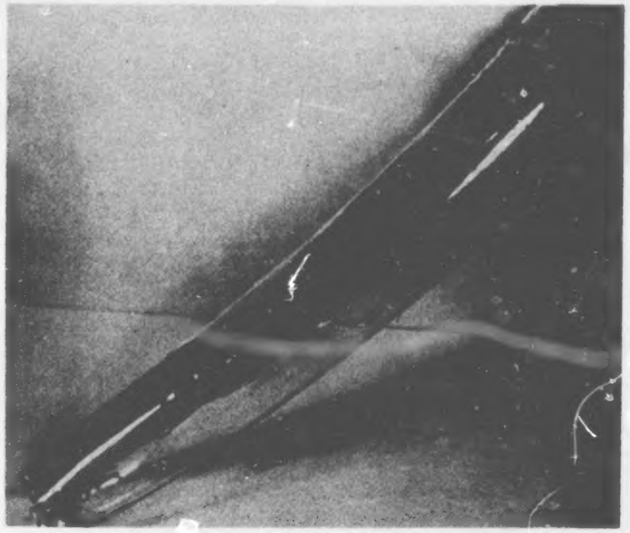

Figure 4-3. Inflated pneumatic splint applied on a patient's arm.

Type of Literature: **MEDIC - TECHNICAL**

Primary User: **WORKER**
Information Objectives: **WHAT IT IS - HOW IT'S USED**

No. of 1 Syll. words/Total No. words: **132/166=80%**
FORCAST Reading Grade Level Score: **8.0**

AFTER

Type of Literature: MEDIC - TECHNICAL
Rewrite Problem(s):
TOO WORDY
RUN-TOGETHER FORMAT

No. of 1 Syll. words/Total No. words: 259/419=62%
FORCAST Reading Grade Level Score: 10.7

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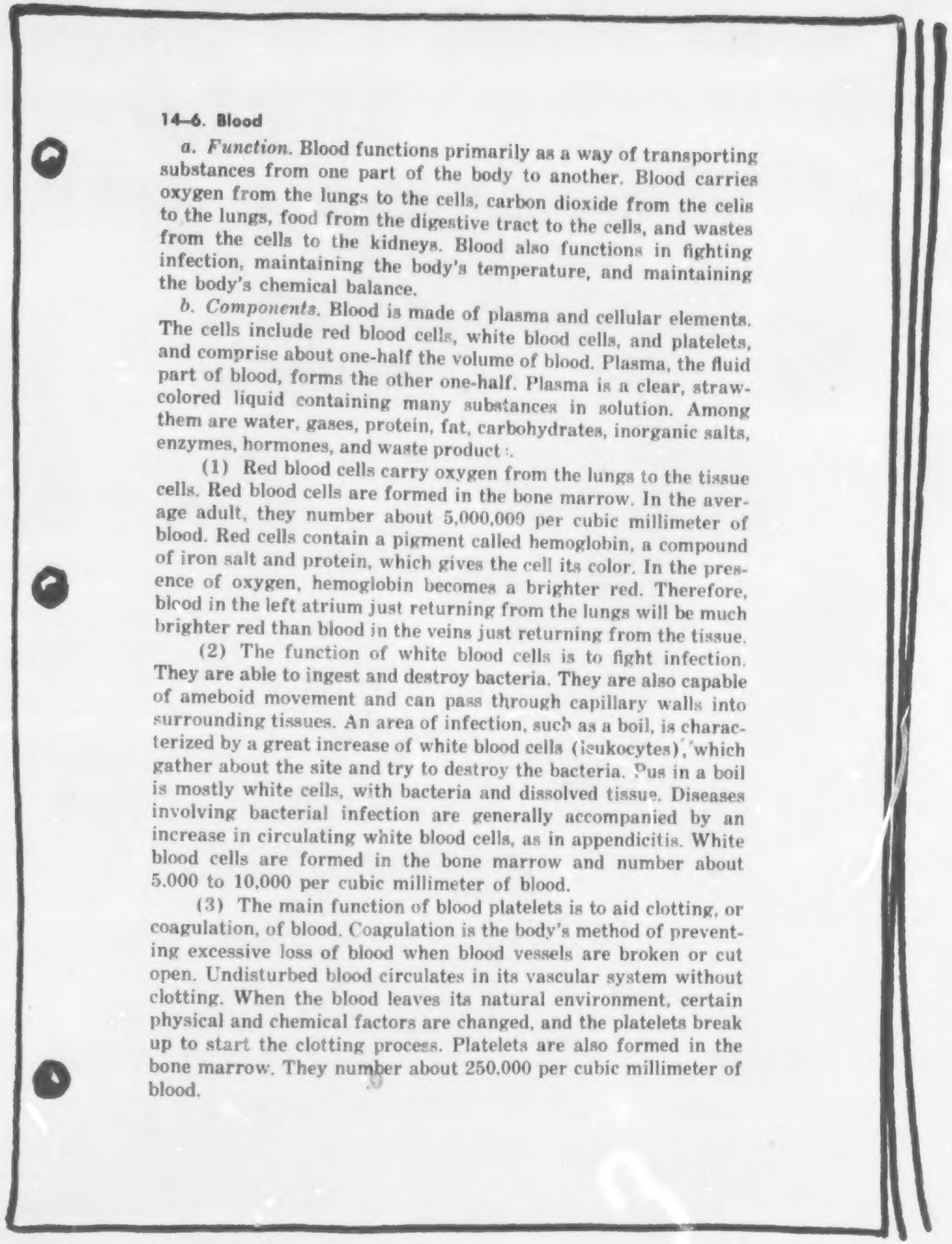

14–6. Blood

a. Function. Blood functions primarily as a way of transporting substances from one part of the body to another. Blood carries oxygen from the lungs to the cells, carbon dioxide from the cells to the lungs, food from the digestive tract to the cells, and wastes from the cells to the kidneys. Blood also functions in fighting infection, maintaining the body's temperature, and maintaining the body's chemical balance.

b. Components. Blood is made of plasma and cellular elements. The cells include red blood cells, white blood cells, and platelets, and comprise about one-half the volume of blood. Plasma, the fluid part of blood, forms the other one-half. Plasma is a clear, straw-colored liquid containing many substances in solution. Among them are water, gases, protein, fat, carbohydrates, inorganic salts, enzymes, hormones, and waste products.

(1) Red blood cells carry oxygen from the lungs to the tissue cells. Red blood cells are formed in the bone marrow. In the average adult, they number about 5,000,009 per cubic millimeter of blood. Red cells contain a pigment called hemoglobin, a compound of iron salt and protein, which gives the cell its color. In the presence of oxygen, hemoglobin becomes a brighter red. Therefore, blood in the left atrium just returning from the lungs will be much brighter red than blood in the veins just returning from the tissue.

(2) The function of white blood cells is to fight infection. They are able to ingest and destroy bacteria. They are also capable of ameboid movement and can pass through capillary walls into surrounding tissues. An area of infection, such as a boil, is characterized by a great increase of white blood cells (leukocytes), which gather about the site and try to destroy the bacteria. Pus in a boil is mostly white cells, with bacteria and dissolved tissue. Diseases involving bacterial infection are generally accompanied by an increase in circulating white blood cells, as in appendicitis. White blood cells are formed in the bone marrow and number about 5,000 to 10,000 per cubic millimeter of blood.

(3) The main function of blood platelets is to aid clotting, or coagulation, of blood. Coagulation is the body's method of preventing excessive loss of blood when blood vessels are broken or cut open. Undisturbed blood circulates in its vascular system without clotting. When the blood leaves its natural environment, certain physical and chemical factors are changed, and the platelets break up to start the clotting process. Platelets are also formed in the bone marrow. They number about 250,000 per cubic millimeter of blood.

14.6. Blood

Function. The blood's main function is to carry nutrients and wastes from one part of your body to another. It carries:

a. oxygen from the lungs to the body cells;

b. carbon dioxide from the cells back to the lungs;

c. food from the digestive track to the cells; and

d. wastes from the cells to the kidneys.

Blood also helps fight infections, keeps your body temperature stable, and keeps the chemicals in your body balanced.

Parts. Blood is made up of plasma and cells. About half the volume of your blood is plasma, and half is cells.

a. *Plasma.* Plasma is the fluid part of your blood. It is a clear liquid the color of straw. It carries water, gases, protein, and fat. It also carries carbohydrates, salts, enzymes, hormones, and wastes.

b. *Cells.* There are three kinds of cells in your blood: red blood cells, white blood cells, and platelets. All three kinds of cells are made in the marrow of your bones.

(1) Red blood cells are small discs with a dent on each side. They bring oxygen from your lungs to the cells of your body. Inside the cells is a compound called hemoglobin. It is the part of the cell that holds the oxygen and gives the cell its red color. There are usually 5,000,000 red blood cells in a cubic millimeter of your blood.

(2) White blood cells come in many shapes. They fight infection in the body. They can move through the walls of a blood vessel to the site of infection. There they kill any bacteria that are present.

Type of Literature: MEDIC - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT IT IS - WHAT IT'S FOR

No. of 1 Syll. words/Total No. words: 281/371=76%
FORCAST Reading Grade Level Score: 8.6

The pus you see in a boil is mostly white blood cells and bacteria. Here the cells are concentrated in one area. If your whole body is infected with a disease, the number of white blood cells increases all over your body. There are usually 5,000 to 10,000 white blood cells in a cubic millimeter of your blood.

(3) Platelets are tiny discs. They help your blood to clot when you are cut. They are inactive in your blood until a blood vessel is broken or cut open. Then their environment is changed. They break up and begin to form clots. There are usually 250,000 platelets in a cubic millimeter of your blood.

AFTER

Type of Literature: MEDIC - TECHNICAL
Rewrite Problem(s):
HARD WORDS WEAK VISUAL AIDS
TOO WORDY
REMOTE REFERENCES
No. of 1 Syll. words/Total No. words: 273/481=57%
FORCAST Reading Grade Level Score: 11.4

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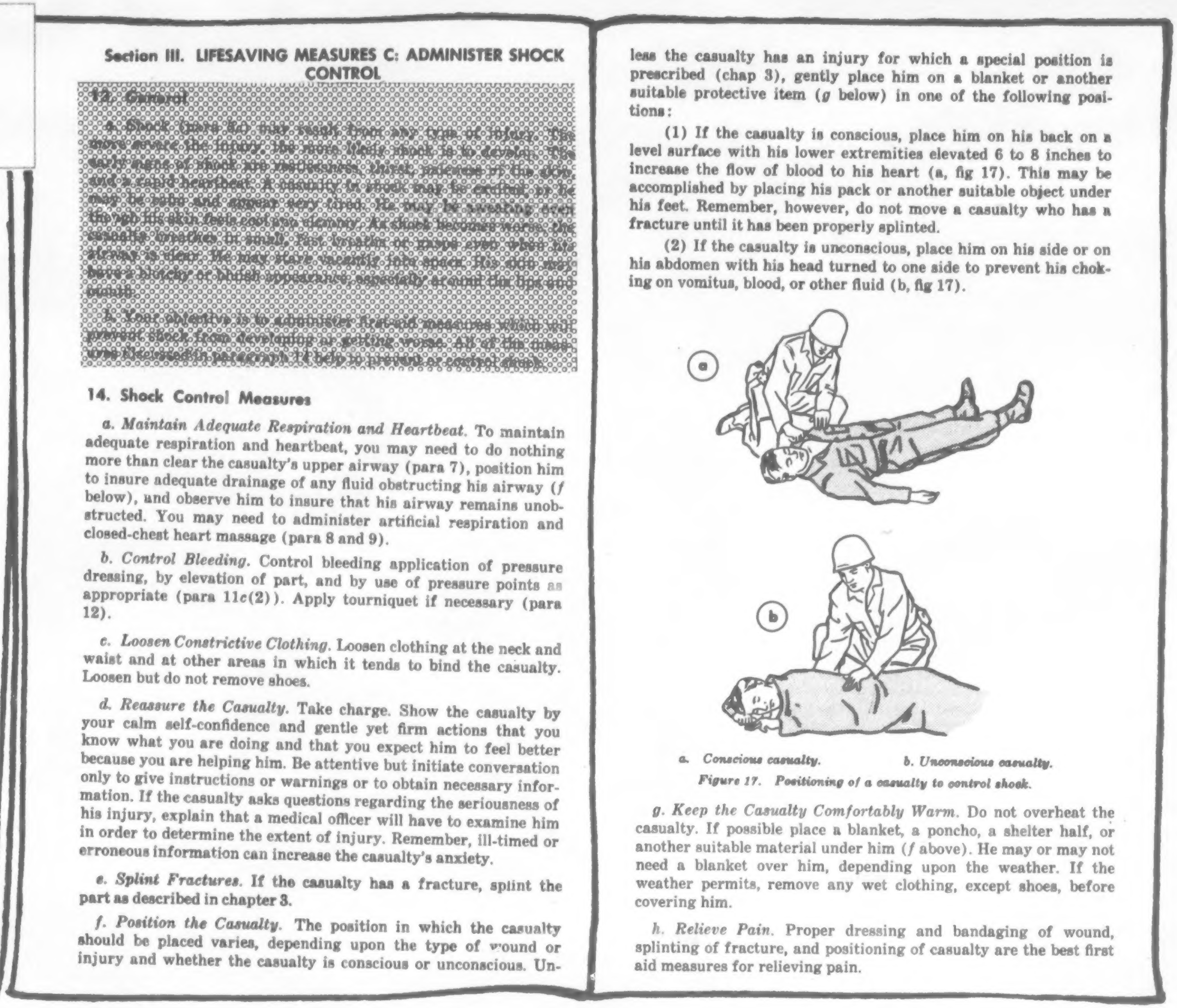

Section III. LIFESAVING MEASURES C: ADMINISTER SHOCK CONTROL

13. General

a. Shock (para 4c) may result from any type of injury. The more severe the injury, the more likely shock is to develop. The early signs of shock are restlessness, thirst, paleness of the skin, and a rapid heartbeat. A casualty in shock may be excited, or he may be calm and appear very tired. He may be sweating even though his skin feels cool and clammy. As shock becomes worse, the casualty breathes in small, fast breaths or gasps even when his airway is clear. He may stare vacantly into space. His skin may have a blotchy or bluish appearance, especially around the lips and mouth.

b. Your objective is to administer first-aid measures which will prevent shock from developing or getting worse. All of the measures discussed in paragraph 14 help to prevent or control shock.

14. Shock Control Measures

a. Maintain Adequate Respiration and Heartbeat. To maintain adequate respiration and heartbeat, you may need to do nothing more than clear the casualty's upper airway (para 7), position him to insure adequate drainage of any fluid obstructing his airway (*f* below), and observe him to insure that his airway remains unobstructed. You may need to administer artificial respiration and closed-chest heart massage (para 8 and 9).

b. Control Bleeding. Control bleeding application of pressure dressing, by elevation of part, and by use of pressure points as appropriate (para 11*c*(2)). Apply tourniquet if necessary (para 12).

c. Loosen Constrictive Clothing. Loosen clothing at the neck and waist and at other areas in which it tends to bind the casualty. Loosen but do not remove shoes.

d. Reassure the Casualty. Take charge. Show the casualty by your calm self-confidence and gentle yet firm actions that you know what you are doing and that you expect him to feel better because you are helping him. Be attentive but initiate conversation only to give instructions or warnings or to obtain necessary information. If the casualty asks questions regarding the seriousness of his injury, explain that a medical officer will have to examine him in order to determine the extent of injury. Remember, ill-timed or erroneous information can increase the casualty's anxiety.

e. Splint Fractures. If the casualty has a fracture, splint the part as described in chapter 3.

f. Position the Casualty. The position in which the casualty should be placed varies, depending upon the type of wound or injury and whether the casualty is conscious or unconscious. Unless the casualty has an injury for which a special position is prescribed (chap 3), gently place him on a blanket or another suitable protective item (*g* below) in one of the following positions:

(1) If the casualty is conscious, place him on his back on a level surface with his lower extremities elevated 6 to 8 inches to increase the flow of blood to his heart (a, fig 17). This may be accomplished by placing his pack or another suitable object under his feet. Remember, however, do not move a casualty who has a fracture until it has been properly splinted.

(2) If the casualty is unconscious, place him on his side or on his abdomen with his head turned to one side to prevent his choking on vomitus, blood, or other fluid (b, fig 17).

a. Conscious casualty. *b. Unconscious casualty.*

Figure 17. Positioning of a casualty to control shock.

g. Keep the Casualty Comfortably Warm. Do not overheat the casualty. If possible place a blanket, a poncho, a shelter half, or another suitable material under him (*f* above). He may or may not need a blanket over him, depending upon the weather. If the weather permits, remove any wet clothing, except shoes, before covering him.

h. Relieve Pain. Proper dressing and bandaging of wound, splinting of fracture, and positioning of casualty are the best first aid measures for relieving pain.

Section III LIFESAVING MEASURES C: TREATMENT FOR SHOCK

14. Steps to Prevent or Control Shock

To help control or prevent shock in an injured man, follow the steps below.

a. *check breathing and heartbeat.* You must be sure the casualty can breathe and that his heart is beating. You may only have to clear his mouth and throat, then be sure they do not get clogged again. You may have to give him artificial respiration or closed-chest heart massage. To help him breathe, loosen clothing at his neck and waist, and anywhere else it is tight. Loosen but do not remove his shoes.

b. *stop the bleeding.* Apply a first aid dressing. Use pressure points and pressure dressings to stop the bleeding. Raise the injured part of the body if no bones in it are broken. Use a tourniquet only if you cannot stop the bleeding any other way.

c. *splint broken bones.* If the casualty has a broken bone, put a splint on it. You must not move him until the bone has been splinted.

d. *position the casualty.* Place the man on a blanket, poncho, or shelter half. The position you place him in depends on the type of wound he has, and whether or not he is conscious.

(1) IF HE IS CONSCIOUS:

Place him on his back on a level surface. Use his pack to keep his feet 6 to 8 inches off the ground. This helps blood get to his head.

(2) IF THE MAN IS NOT CONSCIOUS:

Place him on his side or stomach so he will not choke on blood or other fluids.

e. *keep the man warm.* You have put a blanket, poncho, or shelter half under him to keep him dry. You may have to cover him with a blanket to keep him warm. Take off any wet clothing but his shoes before you cover him. Do not let him overheat.

f. *make the casualty feel secure.* Take charge. Your firm but gentle actions and self-confidence will show the man that you know what you are doing. This will make him trust you and feel secure. If he asks you how badly he is hurt, tell him only a medical officer can measure that. Do not worry or scare the man.

g. *relieve pain.* When you have followed these seven steps, you have done all you can to ease the casualty's pain.

Type of Literature: MEDIC - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT TO DO

No. of 1 Syll. words/Total No. words: 299/371=76%
FORCAST Reading Grade Level Score: 8.6

A
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Type of Literature: **MEDIC - TECHNICAL**
Rewrite Problem(s):
HARD WORDS
NOT DIRECT

No. of 1 Syll. words/Total No. words: **244/369=61%**
FORCAST Reading Grade Level Score: **10.9**

BEFORE

3-4. Control of Hemorrhage

Control of hemorrhage is primarily mechanical. The mechanics of control consist mainly of closing off the open blood vessels. This may be done in several ways. The method most feasible in one instance may not be best in another instance.

a. Direct Pressure. This is the best and usually the most practical, method for the company aidman to use. In this method, blood vessels are compressed against bone and flesh, usually by a pressure dressing applied directly over the wound. Almost any bleeding can be controlled this way. A special type of direct pressure is to apply a clamp directly to the bleeding vessel to close it off. Caution must be exercised that only the bleeding vessel is clamped.

b. Pressure Points. In this method, the artery is compressed at a point proximal to the wound, stopping the flow of blood. This method is not recommended if pressure must be maintained for a long period of time, but may be useful temporarily until a pressure dressing can be applied.

c. Tourniquet. A tourniquet will totally stop the flow of blood in the arm or leg beyond the tourniquet. Consequently, although it will stop the bleeding by compressing all the vessels, it is potentially dangerous because it deprives the uninjured tissues of blood. As a general rule, if a tourniquet is necessary, place it as close as possible to the wound between the heart and the wound to stop the bleeding. Some arteries, however, pass between two bones (as in the forearm) and cannot be compressed by a tourniquet. This would necessitate placing the tourniquet on the upper arm to stop the bleeding. Patients who have tourniquets applied should be clearly identified with a "T" on their forehead. Once applied, a tourniquet should never be loosened or removed, except under the supervision of a medical officer.

d. Elevation. If bleeding from a wound is only venous or capillary, elevation of the wound above the heart may slow the flow of blood. However, elevation is of no value in control of arterial bleeding, and may aggravate fractures.

e. Combination of Methods. A combination of measures is usually most effective. One combination is to use pressure points until a pressure dressing can be applied.

3-5. Clotting

Blood clots are formed by a chemical reaction that occurs when blood platelets escape from [illegible] vessels. Slowing the flow of blood from a vessel improves conditions for formation of a clot.

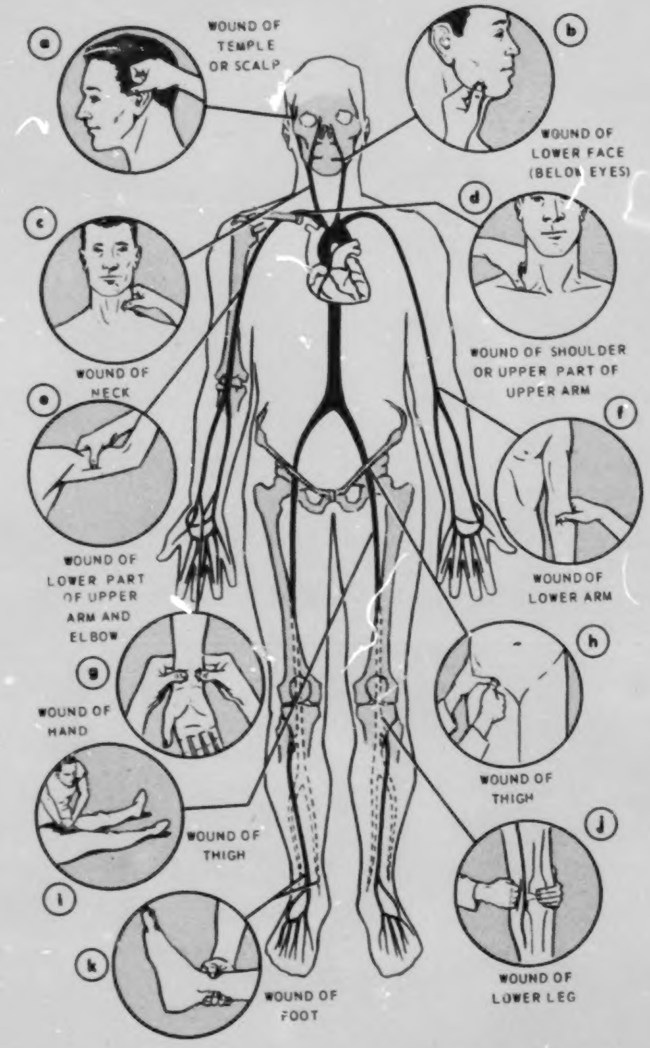


Figure 14. Pressure points for temporary control of arterial bleeding.

Type of Literature: MEDIC - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT TO DO

No. of 1 Syll. words/Total No. words: 243/339=72%
FORCAST Reading Grade Level Score: 9.2

34. CONTROL OF HEMORRHAGE

You can control a hemorrhage by closing off the open blood vessels which cause it. Use one of the ways listed below, or use them together.

a. *Direct pressure.* This is the best method for the company aidman to use. Place a dressing over the wound and press firmly on it. This pushes the blood vessels against bone and flesh, and stops bleeding long enough for a clot to form. You can control most kinds of bleeding this way.

Putting a clamp on the bleeding vessel is a special type of direct pressure. This must be done with caution so that ONLY the vessel that is cut is closed off.

b. *Pressure points.* A pressure point is the place where the main artery to a wound lies close to the skin, and over a bone. Figure 14 shows you the main pressure points. To stop bleeding, press hard with your fingers on a pressure point between the wound and the heart. This is not a good method to use for a long time. You may want to use it just until you can get a direct pressure dressing ready.

c. *Elevation.* If no broken bones are involved, raise the wound above the level of the heart. This will slow bleeding from veins and capillaries, but not from arteries.

d. *Tourniquet.* Use a tourniquet only if you cannot stop the bleeding any other way. It stops the flow of all blood to any part of the arm or leg below it. This can be very dangerous.

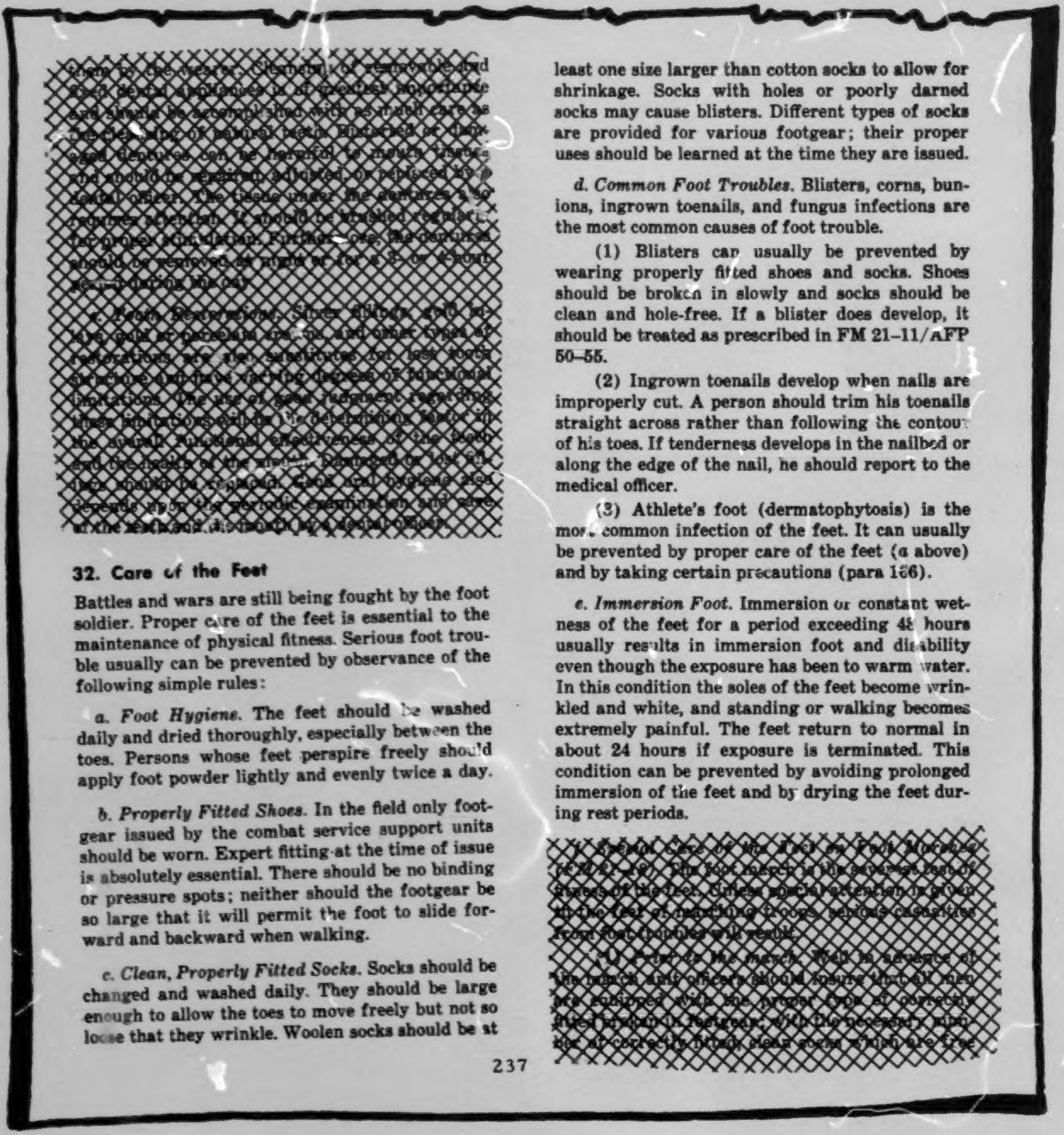
Place the tourniquet very close to the wound, between the wound and the heart. A tourniquet will not work in places like the forearm, where the artery is between two bones. In such cases, place the tourniquet on the upper arm. Mark a "T" on the patient's forehead so that other medics will be able to quickly tell that a tourniquet has been put on the patient. After the tourniquet is on do not loosen or remove it unless a medical officer tells you to.

AFTER

Type of Literature: MEDIC - TECHNICAL
Rewrite Problem(s):
HARD WORDS
NOT DIRECT

No. of 1 Syll. words/Total No. words: 257/416=62%
FORCAST Reading Grade Level Score: 10.7

B E F O R E



[redacted]

32. Care of the Feet

Battles and wars are still being fought by the foot soldier. Proper care of the feet is essential to the maintenance of physical fitness. Serious foot trouble usually can be prevented by observance of the following simple rules:

a. Foot Hygiene. The feet should be washed daily and dried thoroughly, especially between the toes. Persons whose feet perspire freely should apply foot powder lightly and evenly twice a day.

b. Properly Fitted Shoes. In the field only footgear issued by the combat service support units should be worn. Expert fitting at the time of issue is absolutely essential. There should be no binding or pressure spots; neither should the footgear be so large that it will permit the foot to slide forward and backward when walking.

c. Clean, Properly Fitted Socks. Socks should be changed and washed daily. They should be large enough to allow the toes to move freely but not so loose that they wrinkle. Woolen socks should be at least one size larger than cotton socks to allow for shrinkage. Socks with holes or poorly darned socks may cause blisters. Different types of socks are provided for various footgear; their proper uses should be learned at the time they are issued.

d. Common Foot Troubles. Blisters, corns, bunions, ingrown toenails, and fungus infections are the most common causes of foot trouble.

(1) Blisters can usually be prevented by wearing properly fitted shoes and socks. Shoes should be broken in slowly and socks should be clean and hole-free. If a blister does develop, it should be treated as prescribed in FM 21-11/AFP 50-55.

(2) Ingrown toenails develop when nails are improperly cut. A person should trim his toenails straight across rather than following the contour of his toes. If tenderness develops in the nailbed or along the edge of the nail, he should report to the medical officer.

(3) Athlete's foot (dermatophytosis) is the most common infection of the feet. It can usually be prevented by proper care of the feet (*a* above) and by taking certain precautions (para 166).

e. Immersion Foot. Immersion or constant wetness of the feet for a period exceeding 48 hours usually results in immersion foot and disability even though the exposure has been to warm water. In this condition the soles of the feet become wrinkled and white, and standing or walking becomes extremely painful. The feet return to normal in about 24 hours if exposure is terminated. This condition can be prevented by avoiding prolonged immersion of the feet and by drying the feet during rest periods.

[redacted]

237

Type of Literature: MEDIC - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT TO DO

No. of 1 Syll. words/Total No. words: 337/415=81%
FORCAST Reading Grade Level Score: 7.8

A
F
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[illegible]

32. CARE OF THE FEET

If you take care of your feet, you can prevent serious foot troubles. Follow these rules:

a. CLEAN FEET. Wash your feet every day. Dry them thoroughly, especially between the toes. If your feet sweat much, put a light even coat of foot powder on them twice a day.

b. SHOES THAT FIT. When your boots are issued to you, be sure they fit. You will have to wear them all the time when you are in the field. They should not bind your feet or press too hard on them. They should not be so large that your foot slides forward and backward in them when you walk.

c. CLEAN SOCKS THAT FIT. Change and wash your socks each day. There are different kinds of socks for different kinds of footgear. When they are issued to you, learn when to wear each kind. Socks should be large enough so you can move your toes freely, but not so large that they wrinkle. Wool socks shirnk so they should be at least one size larger than your cotton socks. Socks with holes or bad darns may cause blisters; do not wear them.

Sore feet. The most common causes of sore feet are blisters, corns, bunions, ingrown toenails and fungus infections. You can prevent them all if you take good care of your feet.

a. BLISTERS. You can prevent blisters if you wear shoes and socks that fit. Break in your shoes slowly. Wear only clean socks with no holes in them. If you do get a blister, see FM 21/11/AFP 50-55 for details on how to treat it.

b. INGROWN TOENAILS. These may develop if you cut your toenails incorrectly. Be sure to trim the nails straight across, not curved like your toes. If the nailbed or the edge of the nail becomes tender, see a medical officer.

c. ATHLETE'S FOOT. This is the most common fungus foot infection. You can prevent it if you keep your feet clean and dry. You can catch athlete's foot from other people, so always wear sandals in wet areas like the shower.

d. IMMERSION FOOT. You may get immersion foot if your feet are wet for more than 48 hours. The soles of your feet will turn white and be very wrinkled, and it will hurt you to walk or stand on them. Your feet will return to normal 24 hours after you start to keep them dry. To prevent immersion foot, keep your feet out of water when you can, and dry them during rest periods.

[illegible]

Type of Literature: MILITARY POLICE - TECHNICAL
Rewrite Problem(s):
HARD WORDS CONFUSING
TOO VAGUE RUN-TOGETHER FORMAT
TOO WORDY

No. of 1 Syll. words/Total No. words: 794/1407=56%
FORCAST Reading Grade Level Score: 11.6

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b. Radar. Radar offers an accurate, efficient means for determining the speeds of vehicles at given positions. In addition to the visual reading obtained by the operator, radar devices may be equipped to make graphic recordings of the speeds of passing vehicles. Instructions for operating specific types of radar equipment are provided by the manufacturers, and when properly operated and calibrated, any tolerance may be reduced toward zero miles per hour. The principle of operation is simple. The radar timer is actually a low power radio transmitter and receiver. The transmitter sends out continuous, unmodulated radio waves at a frequency of 10,525 megacycles, (the waves travel at the speed of light) and on meeting the metal surface of the car being timed, are reflected. A moving car changes the length of the wave and, therefore, changes the frequency. The change in frequency is proportional to the speed of the car and this change is about 31.4 times the speed of the car. Thus, 10 miles an hour gives a frequency change of 314 cycles per second. These changes in frequency are converted by the radar timer into miles per hour and shown on a direct reading meter scale.

(1) Since the radar is a fairly complicated and technical device, the operator must be well-trained and properly versed in its functions and limitations. The operator must be trained in the following areas:

(*a*) Good site selection.

(*b*) Proper positioning and handling of the antenna.

(*c*) Judging effective operating ranges at different locations and recognizing the various forms of radar interference.

(*d*) Identifying speeding vehicles.

(*e*) Satisfying legal requirements.

(2) The radar is a fragile piece of equipment and must be properly maintained.

(*a*) The device must be calibrated every 6 months by a licensed technician and a record of the calibration must be maintained. Periodic inspections of equipment must be made to keep the radar in operating order.

(*b*) Patrol vehicles assigned to speed surveillance duties using radar must be modified to provide an individual, filtered and fused power connection. Also, in some cases this connection must be shielded to prevent interference from the ignition. Depending on the amount of radar operation expected in the patrol vehicle, a permanent or temporary detachable electrical connector can be joined into the vehicle's electrical system. Finally, the system should be mounted in an eye-level position whereby the operator can observe meter readings with minimum difficulty.

(*c*) The radar cabinet, containing the calibration and adjusting controls, must be mounted securely in a stable, well-ventilated position.

(*d*) The radar antenna is mounted on an adjustable fixture within the patrol vehicle. Since the antenna housing contains a very expensive high frequency transmitter tube, it must be handled with care.

(3) *Radar operating procedures.*

(*a*) The radar is to be used in areas of known speed violations. Generally, the radar operating unit should attempt to work on single-lane roads, or multi-lane streets which have light traffic. When this condition is met, more accurate readings are insured. The radar unit should not be positioned near changes in speed limits or areas of high acceleration or deceleration.

(*b*) The radar unit can be used during all degrees of darkness and is not affected by weather. However, the unit should not be used primarily in one location, but should be moved frequently.

(*c*) When the radar unit is positioned and readied for operation, the operator must log the time and location of transmitter operation (to meet FCC regulations). Then, test runs by patrol units with calibrated speedometers are made in all directions which traffic will be monitored. These test runs must be recorded, with the results, vehicles, location, and time noted.

(*d*) To insure accurate readings during radar operation, the user must—

1. Choose an operating location which is not bothered by outside interference. (Interference consists of other radio signals, large metal objects, or fluorescent and neon lighting.)

2. Position the antenna as near as possible to the line of travel of the monitored traffic to reduce errors in the readings from traffic not paralleled to the radar units. (This error usually gives a slower reading than the actual speed.) The radar antenna is aimed at a point in the center of the lane of traffic being checked. (Usually this distance is 400 ft from the antenna.)

3. Disregard the readings if more than one vehicle is in the radar zone, since it is difficult to determine which vehicle is being monitored.

(4) *Speed checking.* Generally, single vehicles within the range of the radar present few problems. However, if several vehicles are in range, good judgment is required. The following are some factors to be considered:

(*a*) The radar speed meter indicates the instantaneous speed of the fastest vehicles in range, provided it presents a reasonably large relative area to act as a reflector to the radar beam.

(*b*) It is possible for a faster, overtaking vehicle to be screened by a larger, slow-moving vehicle through the radar-beam area. In this case the speed of the slower vehicle is represented on the speed meter.

(*c*) The range of the [illegible] depends largely on the reflective area of the vehicle being checked. A motorcycle at 150 feet may be out of range, while a large semitrailer or bus at 1,600 feet would thus give a steady reading. In this situation it is concluded that the reading obtained is from the semitrailer or bus, due to the fact that after the motorcycle passed through the area being checked, a steady reading continues on the speed meter, indicating that the target is still in the radar beam.

(*d*) Low-slung vehicles with large glass area and small vehicles make aiming of the radar beam more critical to obtain satisfactory readings.

(*e*) Do not operate the radio transmitter while observing speed readings since this action may cause an erroneous high radar reading. Any mobile transmitter operating within approximately 50 feet may cause an erroneous reading on the high side.

(*f*) When the radar is in operation, antennas should never be left pointed at stationary metallic objects within a distance of 4 feet from the end of the antennas. To do so may damage the mixer crystal in the radar head, causing the radar to suffer a loss of range or permanent damage.

(*g*) Before leaving an operating location, calibration of the radar should be checked with the tuning fork and the results logged. If at a single location for a long period of time, additional calibration checks may be made. All calibration checks should be logged for future reference.

(5) During the operation of radar, usually two patrols are used. One patrol vehicle is responsible for the radar operation. The second is the apprehending patrol. Each of these units have specified duties, for which successful prosecution depends.

(*a*) The military police in the car operating the radar device are responsible for the correct procedures for setting up the radar unit. These procedures include—

1. Voltage tests, accuracy (tuning fork), and test runs by the apprehending car through the radar net, both before and after the arrest.

2. Operating the equipment according to schooling and that is appeared to be functioning properly.

3. Reading of the radar dial.

4. Description of car (as complete as possible, including license, color, make, year, and model).

5. Place and time of the violation and the location of traffic/speed signs.

6. Relaying information to the military policemen in the apprehending car. (The MPs may not testify what they told the MPs in the apprehending car, since that would be hearsay and inadmissible. They merely testify as to what they observed and that they gave this information to the MPs in the pursuit car.)

(*b*) Military policemen in the apprehending patrol obtain and testify to—

1. The receipt of information concerning violator from the radar car. (In this situation, they may not testify to what the radar operator told them, but merely that they received information. Then, that upon the receipt of this information, they stopped the violator.)

2. The speedometer reading of pursuit car if the violator was paced.

3. The accuracy of pursuit patrol's speedometer (factory certified or calibrated) and result of test runs through radar net before and after the violator's arrest.

4. The description of the violator, car license, color, make, year, model, and as he observed them.

5. Identification of accused as the driver of the vehicle.

6. Conversation with the violator (the MPs may testify they told the accused that the other MPs in the radar car radioed them that the vehicle—described as to license, color, make, model, etc., was operating at a certain speed in violation of the law and to any further conversation).

Type of Literature: **MILITARY POLICE - TECHNICAL**

Primary User: **WORKER**
Information Objectives: **WHAT IT IS - WHAT TO DO**

No. of 1 Syll. words/Total No. words: **821/1141=72%**
FORCAST Reading Grade Level Score: **9.2**

6-6. USING RADAR TO CHECK VEHICLE SPEEDS

a. HOW RADAR MEASURES SPEED

Radar is a quick and accurate way for you to measure the speeds of passing vehicles from a fixed position. You can read the speeds from a meter, or you can set up the radar to make a written record of them. The people who make each type of radar give instructions for using it. When it is properly run and tuned, it is a very accurate system.

The way radar works is simple. The radar timer is a low power radio transmitter and receiver. It sends out continuous, unmodulated radio waves at a frequency of 10,525 megacycles per second. The waves travel at the speed of light. The metal body of the car you are timing reflects them back to the receiver.

A moving car will change the length of the waves, and thus their frequency. This change in frequency depends on how fast the car is going. The change is about 31.4 times the speed of the car. This means that for a car going 10 miles an hour, the change in frequency is 314 cycles per second. The radar timer notes this change and converts it to miles per hour for you. You read it directly as a speed from the meter.

b. PREPARING FOR USE

Radar is fragile and complex. It must be calibrated every six months by a technician, and checked often while you use it. The log book should show all calibrations and repairs. Patrol cars using radar have to be specially prepared and fitted. The radar is mounted carefully and securely in the car.

NOTE: The antenna housing holds a very expensive tube. Handle it with care.

Two patrol cars work together to run a radar speed check: one to run the radar, and one to stop violators. As a patrolman in the radar operating car you will have the job of setting up and using the radar. You must know how to:

(1) *Choose a site for the radar.* You can use a radar unit day or night, in any kind of weather. Use it on roads which have light traffic, in areas where you know the speed limit is often broken. Do not place the radar near a change in the speed limit, at the top or bottom of a hill, or near an intersection. Choose a site where your radar will not get interference from radio signals, large metal objects, or neon or fluorescent lights. Move the unit from one place to another often.

(2) *Place your antenna.* Place the antenna as close as you can to the line of traffic. First place the car near one end of the lane of traffic you plan to check. Aim the antenna in the car about 400 feet down the road, at the center of the lane of traffic. Aim it as straight down the line of traffic as you can or the radar will give readings lower than the real speed.

NOTE: While the radar is on, never leave the antenna pointed at any fixed metal object within 4 feet of your car.

(3) *Test the radar.* When the radar is in place and ready to run, log the time and place you are working from. Have a patrol or pursuit car with an accurate speedometer make test runs through your radar. Be sure to run tests from all the directions you plan to check. Log the time, vehicles used, results and site of the test runs.

Before you leave the site, check your radar calibration with a tuning fork. If you work from one site for a long time, check the radar a few times while you are there. Log all calibration checks.

(4) *Read the radar.* At times two or more vehicles may be in your radar zone at once. It may not be easy to tell which one the radar is timing. Usually the radar speed meter shows the speed of the fastest moving vehicle in your range. A large slow vehicle may screen a small fast one from the radar beam. In this case, the meter will show the speed of the vehicle. Use common sense to know which vehicle the speed reading belongs to.

The range of the radar depends on the reflective area of the vehicle that is in the radar beam. A motor cycle may move out of range at 150 feet, and a bus at 1,500 feet. Small vehicles and low-slung vehicles with lots of glass have short ranges. You must aim the radar beam carefully to measure their speeds correctly.

NOTE: Never use your radio transmitter while you are reading speeds from the radar. It will make the radar give high readings.

c. DUTIES DURING USE

The radar and pursuit patrolman work together as a team to identify a speeder and collect all the information they will need to present in court. The recording and reporting duties of each are listed below.

(1) *Patrolman in radar car.* When your radar indicates that a vehicle is speeding you will:

(a) Alert the MPs in the pursuit car.

(b) Tell them the indicated speed, color, make, model, year, and license number of the speeding vehicle.

(c) Write the car description down in your log book.

(d) Also write down in the log the place and time of the violation and the location of traffic and speed signs in the area.

(e) Testify only to what you saw, what you did, and your record of this in your log book. In testifying you can not describe what you told the MPs in the pursuit car or what they told you.

(2) *Patrolman in pursuit car.* As a patrolman in the pursuit car you will:

(a) Be ready to pursue a violator when you are alerted by the radar car.

(b) Pace the violator if you can and write your speedometer reading down in your log. Be prepared to testify in court on the accuracy of the speedometer in the pursuit car (factory certified or calibrated).

(c) Inform the violator that his car was the one described to you as speeding by the radar car. Be prepared to testify in court on results of test runs made through the radar net before and after the violator's arrest.

(d) Write down in your log book the description and name of the driver, your conversation with the driver and a full description of his car (license number, color, make, year, and model). Be prepared to identify in court the driver and the car he was driving.

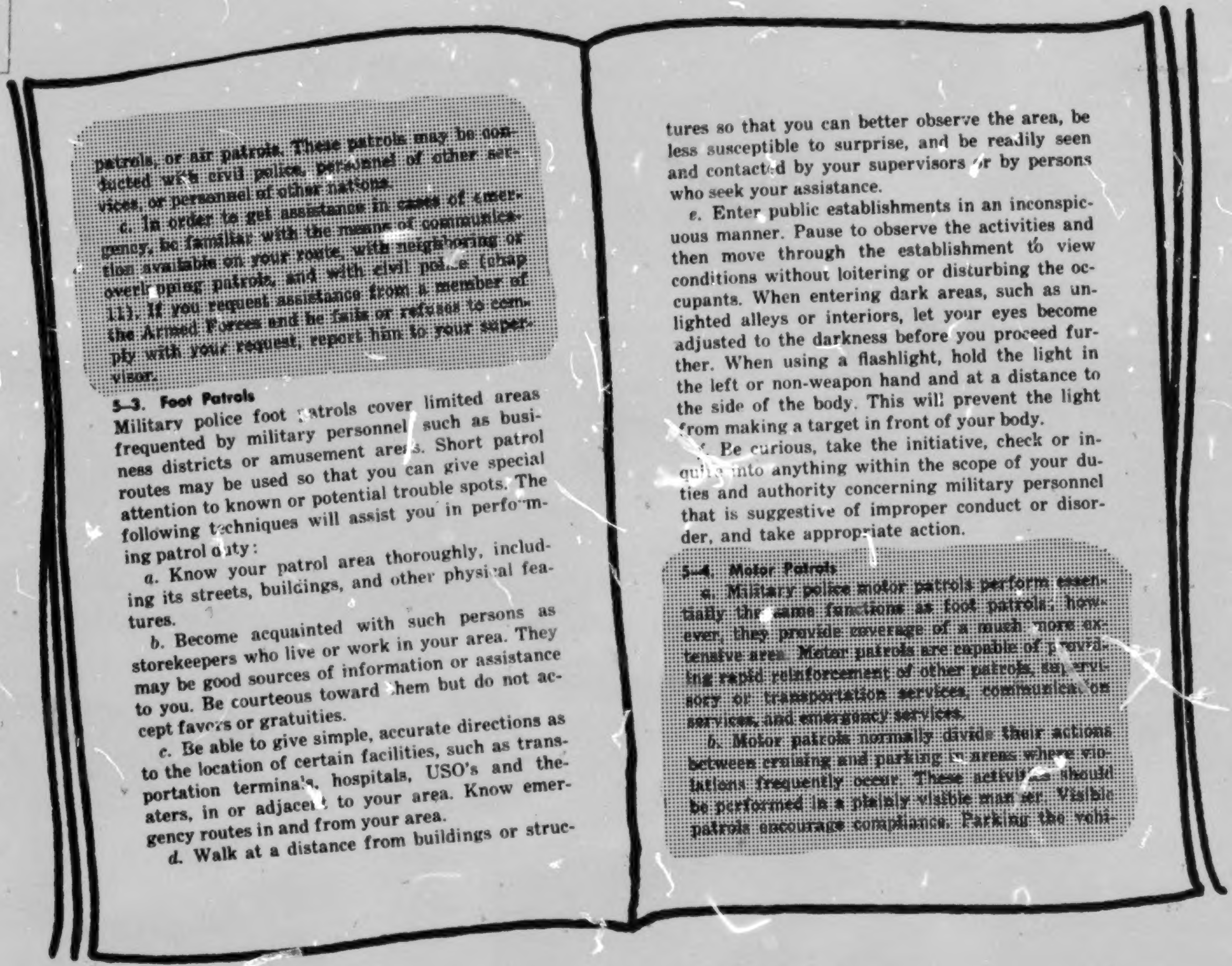
(e) Testify only to what you saw, what you did, your conversation with the violator and your record of this in your logbook. In testifying, you cannot describe what the MPs in the radar car told you. You can only testify that MPs in the radar car gave you information and that after getting this information you stopped the violator.

AFTER

Type of Literature: MILITARY POLICE - TECHNICAL
Rewrite Problem(s):
LONG SENTENCES
CONFUSING
RUN-TOGETHER FORMAT

No. of 1 Syll. words/Total No. words: 165/289=57%
FORCAST Reading Grade Level Score: 11.5

BEFORE



patrols, or air patrols. These patrols may be conducted with civil police, personnel of other services, or personnel of other nations.

c. In order to get assistance in cases of emergency, be familiar with the means of communication available on your route, with neighboring or overlapping patrols, and with civil police (chap 11). If you request assistance from a member of the Armed Forces and he fails or refuses to comply with your request, report him to your supervisor.

5–3. Foot Patrols
Military police foot patrols cover limited areas frequented by military personnel, such as business districts or amusement areas. Short patrol routes may be used so that you can give special attention to known or potential trouble spots. The following techniques will assist you in performing patrol duty:

a. Know your patrol area thoroughly, including its streets, buildings, and other physical features.

b. Become acquainted with such persons as storekeepers who live or work in your area. They may be good sources of information or assistance to you. Be courteous toward them but do not accept favors or gratuities.

c. Be able to give simple, accurate directions as to the location of certain facilities, such as transportation terminals, hospitals, USO's and theaters, in or adjacent to your area. Know emergency routes in and from your area.

d. Walk at a distance from buildings or structures so that you can better observe the area, be less susceptible to surprise, and be readily seen and contacted by your supervisors or by persons who seek your assistance.

e. Enter public establishments in an inconspicuous manner. Pause to observe the activities and then move through the establishment to view conditions without loitering or disturbing the occupants. When entering dark areas, such as unlighted alleys or interiors, let your eyes become adjusted to the darkness before you proceed further. When using a flashlight, hold the light in the left or non-weapon hand and at a distance to the side of the body. This will prevent the light from making a target in front of your body.

f. Be curious, take the initiative, check or inquire into anything within the scope of your duties and authority concerning military personnel that is suggestive of improper conduct or disorder, and take appropriate action.

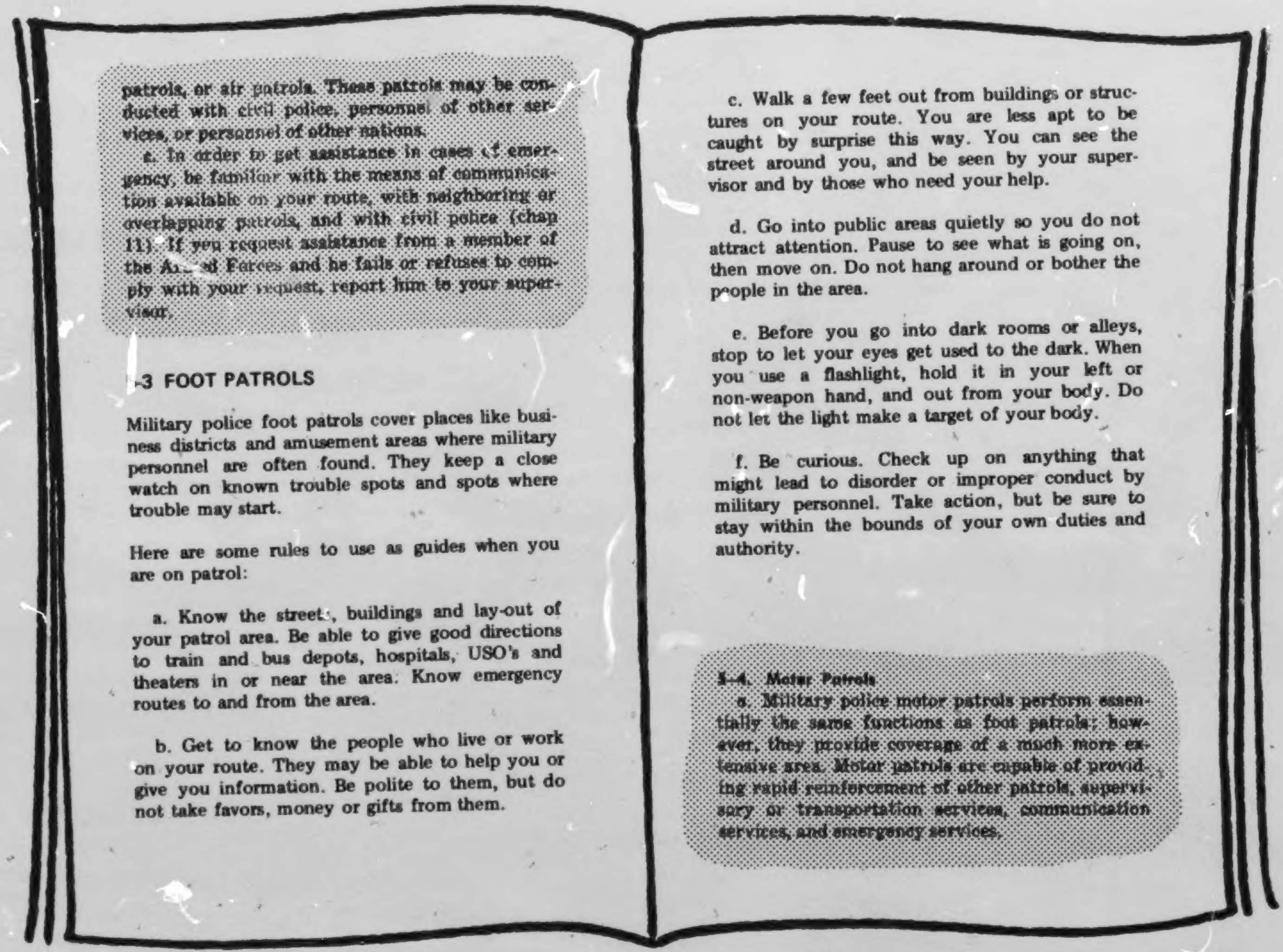
5–4. Motor Patrols
a. Military police motor patrols perform essentially the same functions as foot patrols; however, they provide coverage of a much more extensive area. Motor patrols are capable of providing rapid reinforcement of other patrols, supervisory or transportation services, communication services, and emergency services.

b. Motor patrols normally divide their actions between cruising and parking in areas where violations frequently occur. These activities should be performed in a plainly visible manner. Visible patrols encourage compliance. Parking the vehi-

Type of Literature: **MILITARY POLICE - TECHNICAL**

Primary User: **WORKER**
Information Objectives: **WHAT TO DO**

No. of 1 Syll. words/Total No. words: **208/276=75%**
FORCAST Reading Grade Level Score: **8.8**



patrols, or air patrols. These patrols may be conducted with civil police, personnel of other services, or personnel of other nations.

e. In order to get assistance in cases of emergency, be familiar with the means of communication available on your route, with neighboring or overlapping patrols, and with civil police (chap 11). If you request assistance from a member of the Armed Forces and he fails or refuses to comply with your request, report him to your supervisor.

-3 FOOT PATROLS

Military police foot patrols cover places like business districts and amusement areas where military personnel are often found. They keep a close watch on known trouble spots and spots where trouble may start.

Here are some rules to use as guides when you are on patrol:

a. Know the streets, buildings and lay-out of your patrol area. Be able to give good directions to train and bus depots, hospitals, USO's and theaters in or near the area. Know emergency routes to and from the area.

b. Get to know the people who live or work on your route. They may be able to help you or give you information. Be polite to them, but do not take favors, money or gifts from them.

c. Walk a few feet out from buildings or structures on your route. You are less apt to be caught by surprise this way. You can see the street around you, and be seen by your supervisor and by those who need your help.

d. Go into public areas quietly so you do not attract attention. Pause to see what is going on, then move on. Do not hang around or bother the people in the area.

e. Before you go into dark rooms or alleys, stop to let your eyes get used to the dark. When you use a flashlight, hold it in your left or non-weapon hand, and out from your body. Do not let the light make a target of your body.

f. Be curious. Check up on anything that might lead to disorder or improper conduct by military personnel. Take action, but be sure to stay within the bounds of your own duties and authority.

3-4. Motor Patrols

a. Military police motor patrols perform essentially the same functions as foot patrols; however, they provide coverage of a much more extensive area. Motor patrols are capable of providing rapid reinforcement of other patrols, supervisory or transportation services, communication services, and emergency services.

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Type of Literature: MILITARY POLICE - TECHNICAL
Rewrite Problem(s):
LONG SENTENCES RUN-TOGETHER FORMAT
TOO WORDY
CONFUSING
No. of 1 Syll. words/Total No. words: 556/965=58%
FORCAST Reading Grade Level Score: 11.3

BEFORE

CHAPTER 7

PROCEDURES FOR STOPPING VIOLATORS OF TRAFFIC LAWS

Section I. IDENTIFICATION, PURSUIT, AND APPROACH OF VIOLATORS

7–1. Identification

a. When a violation has been observed, the military police identify the violator's vehicle by noting the license number, make, color, or other easily identifiable marks. This will insure that should the patrol lose sight of vehicle due to heavy traffic, the military police will later be able to identify the vehicle. This identification also provides evidence for subsequent administrative or disciplinary action deemed appropriate by the commander.

b. The identification of military vehicles is nearly the same as the identification of privately owned vehicles. The military policeman records the following:

(1) The type of vehicle.

(2) The bumper markings of military license plate.

(3) Additional information to include, USA number, road clearance number (if used), vehicle classification, number of occupants, sex or other identifying features.

c. Upon identifying the vehicle, the military policeman should check the stolen vehicle list. If the vehicle is stolen, this will give the military police time to plan what action will be necessary to protect themselves upon stopping the violator.

7–2. Pursuit of the Violator

The most important consideration of the pursuit is safety of the military police and the public. To begin the pursuit, the patrol enters the flow of traffic swiftly, yet safely. Overtaking the violator's vehicle is done as quickly as possible but not in a reckless manner. The patrol notifies the military police station by radio when pursuit begins and when the pursued vehicle is stopped. All pertinent information such as make of vehicle, license number, number of occupants and their sex, and location must be reported. In the event the patrol is injured, this information can assist others in apprehending the violators.

7–3. Stopping the Traffic Violator

Selection of the place where the violator is to be stopped is largely based on safety considerations; the place should be sufficiently large to allow vehicles to park as described below. Signalling the violator to stop can ordinarily be accomplished by moderate use of lights and horn, although in some cases it may be necessary to use the siren or even to pull alongside the violator and give oral directions. Care should be taken when using the siren because some drivers become excited and confused. Some drivers react unexpectedly and without due caution which, in turn, endangers other drivers, to include the military police patrol. When the violator has been stopped, the military police vehicle is parked approximately ten to twelve feet (1 car length) to the rear, and off-set three feet to the left of the stopped violator's vehicle (fig. 7-1). With the patrol vehicle in this position, the military policeman is protected to a degree from oncoming traffic when he is alongside the violator's vehicle, and if the violator attempts to ram the patrol car, evasive action can be taken to avoid being struck. When leaving the vehicle, warning lights are left on to alert other drivers of impending danger. When it becomes necessary to stop a violator on a major highway or freeway, both vehicles are pulled off the driving surface and onto the shoulder of the road as far as possible to avoid being struck by moving traffic.

7–4. Approach to the Traffic Violator's Vehicle

a. Front Seat Occupied Only. The driver and rider approach the violator's vehicle from the left and right respectively (figs. 7-1 and 7-2). The military policeman on the passenger side stops at the right rear of the violator's vehicle. From this position he can observe the occupants of the vehicle and can act as a protective cover for the military police driver. The military police driver proceeds to the front edge of the driver's (violator's) door and upon checking the rear seat and floor, keeps the violator in sight at all times. While speaking to the violator, the military police driver stands approximately 2 feet from the vehicle and in line with the front edge of the driver's (violator's) door, facing the violator. This position prevents him from being struck by the door if it is suddenly opened and enables him to observe the violator's movements and oncoming traffic.

b. Front and Back Seats Occupied. The driver and rider approach the violator's vehicle from the left and right respectively as in *a*, above. The military police driver proceeds to the front edge of the driver's (violator's) door, checking the front seat and floor. He then positions himself at a location approximately center of the violator's vehicle. From his position he can observe any actions of the occupants of both the front and rear seats (fig. 7-2).

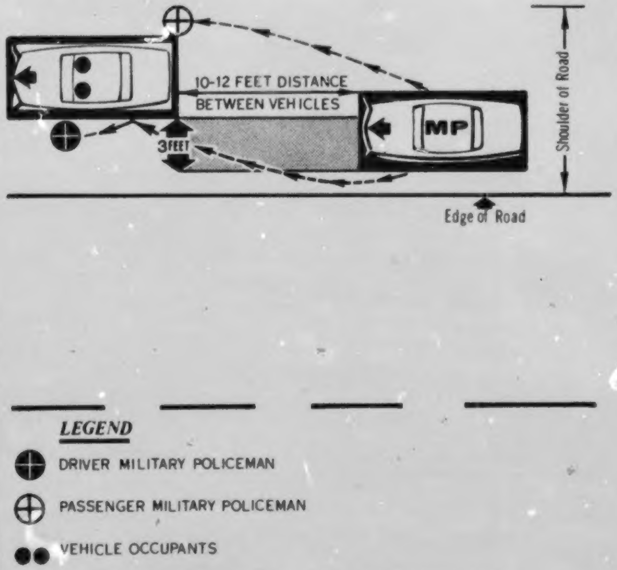


Figure 7-1. Correct position of the MP sedan in relation to the violator's vehicle, and approach to the violator's vehicle.

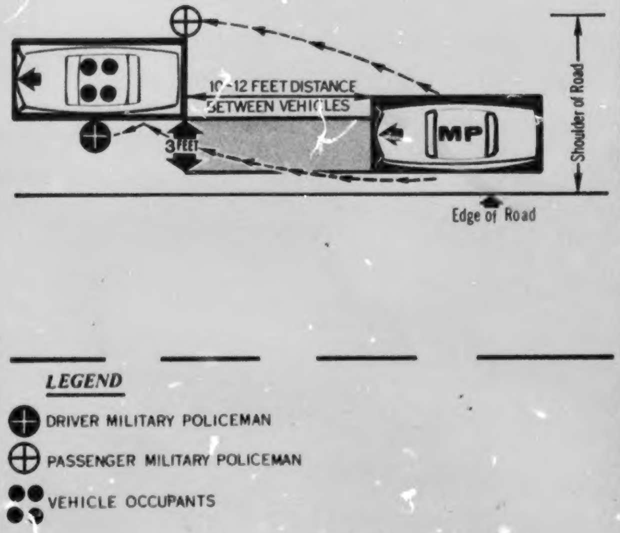


Figure 7-2. Correct approach to the violator's vehicle and position of military policemen when both the front and rear seats are occupied.

c. Vehicle Approach by a Single Patrolman. The method of approach to the violator's vehicle will change when military police are patrolling alone. When alone, upon stopping the violator, the patrolman exits his vehicle, walking up to the vehicle, stopping long enough to observe the back seat and floor. He then proceeds to the front edge of the violator's door. When there are occupants in the rear seat, the patrolman stands at a location approximately center of the violator's vehicle; this will allow an unobstructed view of both the front and rear seats.

d. Violator's Exit From Vehicle. In situations where it is necessary to have the violator dismount, the military policeman opens the driver's (violator's) door, if traffic conditions allow, moving backwards with the swing of the door. The violator is required to move around the front of his vehicle, with the military policeman following, and is directed to stand on the curb or sidewalk at the right front of his vehicle. If the traffic conditions are such, and the vehicles are parked in a manner which would endanger both the military policeman and the violator, both exit their vehicles from the right side, away from the line of traffic. Whether exiting from the right or left, caution is always used when approaching the violator to insure the safety of the military police.

Type of Literature: MILITARY POLICE - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT TO DO

No. of 1 Syll. words/Total No. words: 323/451=72%
FORCAST Reading Grade Level Score: 9.2

CHAPTER 7

PROCEDURES FOR STOPPING VIOLATORS OF TRAFFIC LAWS

Section I. IDENTIFICATION, PURSUIT, AND APPROACH OF VIOLATORS

7-1 IDENTIFICATION

When you see someone break a traffic law:

a. If it is a *private vehicle* write down:

(1) license number, make and color of the vehicle

(2) number of people in the vehicle, and their sex

(3) any other marks on the vehicle that would help identify it.

b. If it is a *military vehicle* write down:

(1) number and bumper markings of the military license plate

(2) type and classification of the vehicle

(3) USA and road clearance numbers

(4) number of people in the vehicle, and their sex

(5) any other marks that would help identify the vehicle.

c. Check to see if the vehicle is on the stolen vehicle list. If the vehicle is stolen you will want to plan how to approach it and yet protect yourself after you do stop it.

7-2. GOING AFTER THE VIOLATOR

Remember: Your safety and that of the public are the most important things to think about at all times.

a. Enter the flow of traffic to begin pursuit.

b. Radio your station to let them know you are in pursuit. Give then your location and all information you have to identify the vehicle you are pursuing. This will help others find the vehicle if it gets away from you.

c. Overtake the violator's vehicle.

d. Radio the station when you have stopped the vehicle. Be sure to give your new location.

7-3. STOPPING THE VIOLATOR

a. Use your lights, horn, or voice to signal the violator to pull over and stop. Use your siren only if you cannot stop him any other way.

NOTE: The siren may scare and confuse the driver and cause him to react suddenly in a way dangerous to you and other traffic.

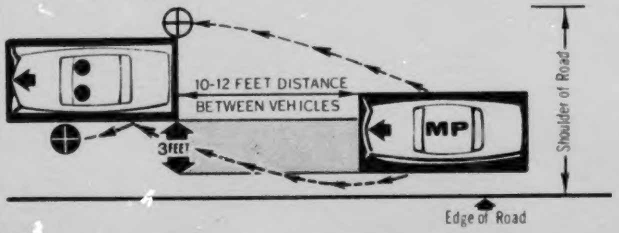
b. Direct the violator to the right edge of the road. Choose a place large enough so both your car and his can pull all the way off the road.

c. Park your car 10 to 12 feet to the rear of the violator's car and 3 feet to the left of it. In this position your car protects you from oncoming traffic. You also have room to move out of the way if the violator tries to ram your car.

d. Leave your warning lights on so other drivers will know your car is stopped.

7-4. GOING UP TO THE VIOLATOR'S VEHICLE

a. *People in front seat only.*



DRIVER MILITARY POLICEMAN

Keep violator in sight at all times.
Approach from left side.
Stop at rear window.
Check rear seat and floor.

NOTE:

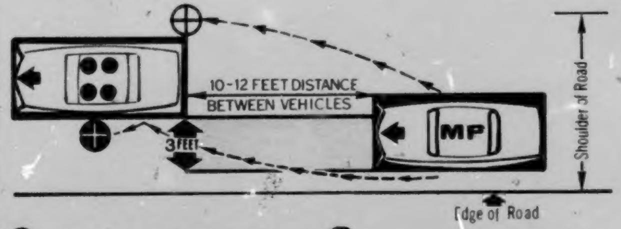
If no partner, driver must be particularly sure that his check is thorough.

Go to front edge of driver's door.
Stand about 2 feet from vehicle, in line with front edge of door, facing violator.
Watch both violator and oncoming traffic.

PASSENGER MILITARY POLICEMAN

Approach from right side.
Stop at right rear of vehicle.
Watch the people in the vehicle.
Be ready to give protective cover if driver needs it.

b. *People in both front and rear seats.*



DRIVER MILITARY POLICEMAN

Keep violator in sight at all times.
Approach from left side.
Stop at rear window.
Check rear seat and floor.

NOTE:

If no partner, driver must be particularly sure that his check is thorough.

Go to front edge of driver's door.
Check front seat and floor.
Go to a point near center of vehicle.
Watch the people in both front and back.

PASSENGER MILITARY POLICEMAN

Approach from right side.
Stop at right rear of vehicle.
Watch the people in the vehicle.
Be ready to give protective cover if driver needs it.

7-5. HAVING THE VIOLATOR LEAVE HIS VEHICLE

When you need to have the violator get out of his vehicle:

a. Check for oncoming traffic.

b. Open the driver's door and move backwards with the door.

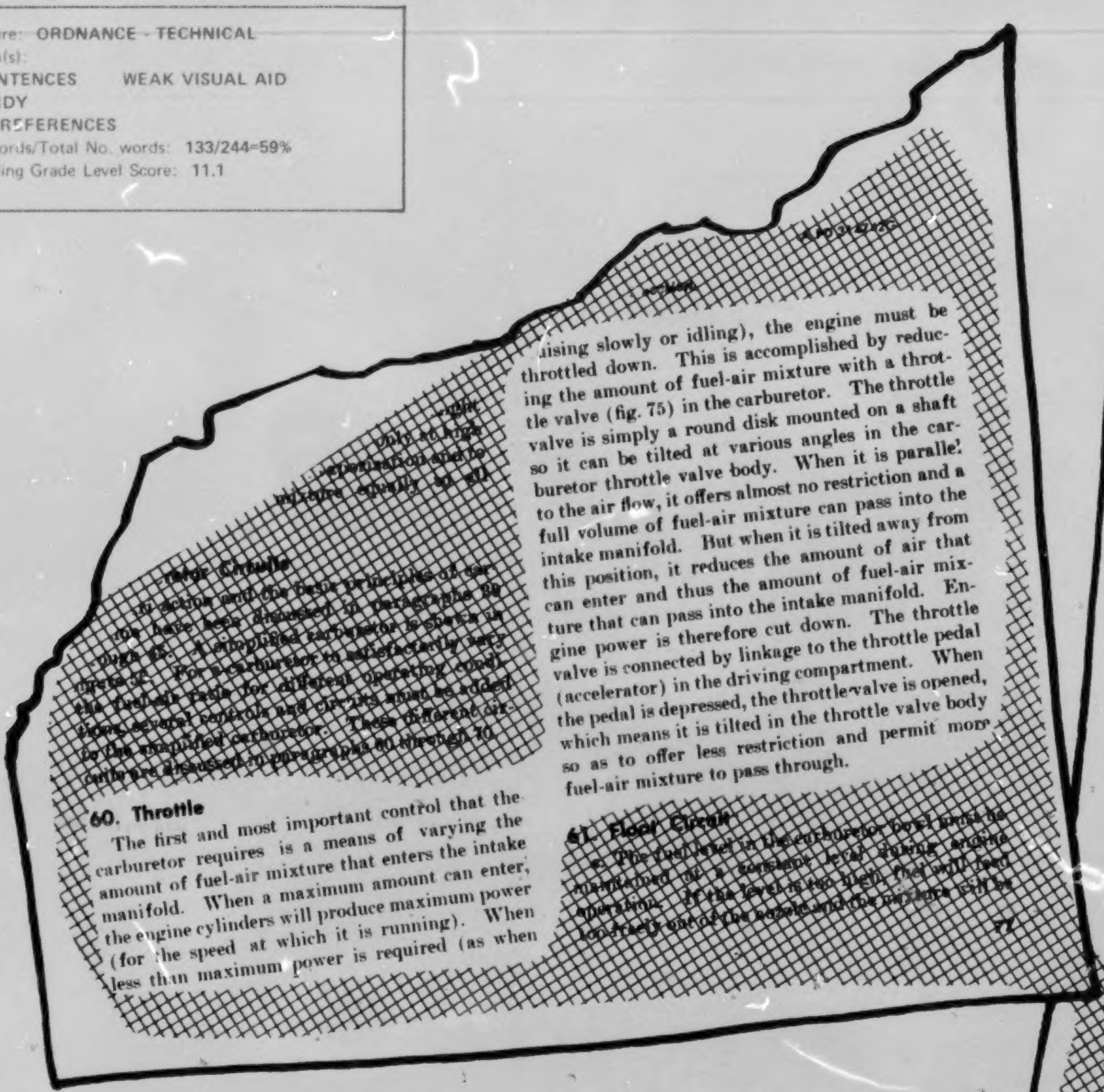
NOTE: When traffic makes it unsafe for the violator to get out of the driver's side of his vehicle, open the passenger side door for him.

c. Tell the driver to move around to the front of his vehicle. You stay behind him, following him to the curb or sidewalk to the right of his vehicle.

AFTER

Type of Literature: ORDNANCE - TECHNICAL
Rewrite Problem(s):
LONG SENTENCES WEAK VISUAL AID
TOO WORDY
REMOTE REFERENCES
No. of 1 Syll. words/Total No. words: 133/244=59%
FORCAST Reading Grade Level Score: 11.1

BEFORE



60. Throttle

The first and most important control that the carburetor requires is a means of varying the amount of fuel-air mixture that enters the intake manifold. When a maximum amount can enter, the engine cylinders will produce maximum power (for the speed at which it is running). When less than maximum power is required (as when

…ising slowly or idling), the engine must be throttled down. This is accomplished by reducing the amount of fuel-air mixture with a throttle valve (fig. 75) in the carburetor. The throttle valve is simply a round disk mounted on a shaft so it can be tilted at various angles in the carburetor throttle valve body. When it is parallel to the air flow, it offers almost no restriction and a full volume of fuel-air mixture can pass into the intake manifold. But when it is tilted away from this position, it reduces the amount of air that can enter and thus the amount of fuel-air mixture that can pass into the intake manifold. Engine power is therefore cut down. The throttle valve is connected by linkage to the throttle pedal (accelerator) in the driving compartment. When the pedal is depressed, the throttle valve is opened, which means it is tilted in the throttle valve body so as to offer less restriction and permit more fuel-air mixture to pass through.

61. Float Circuit

77

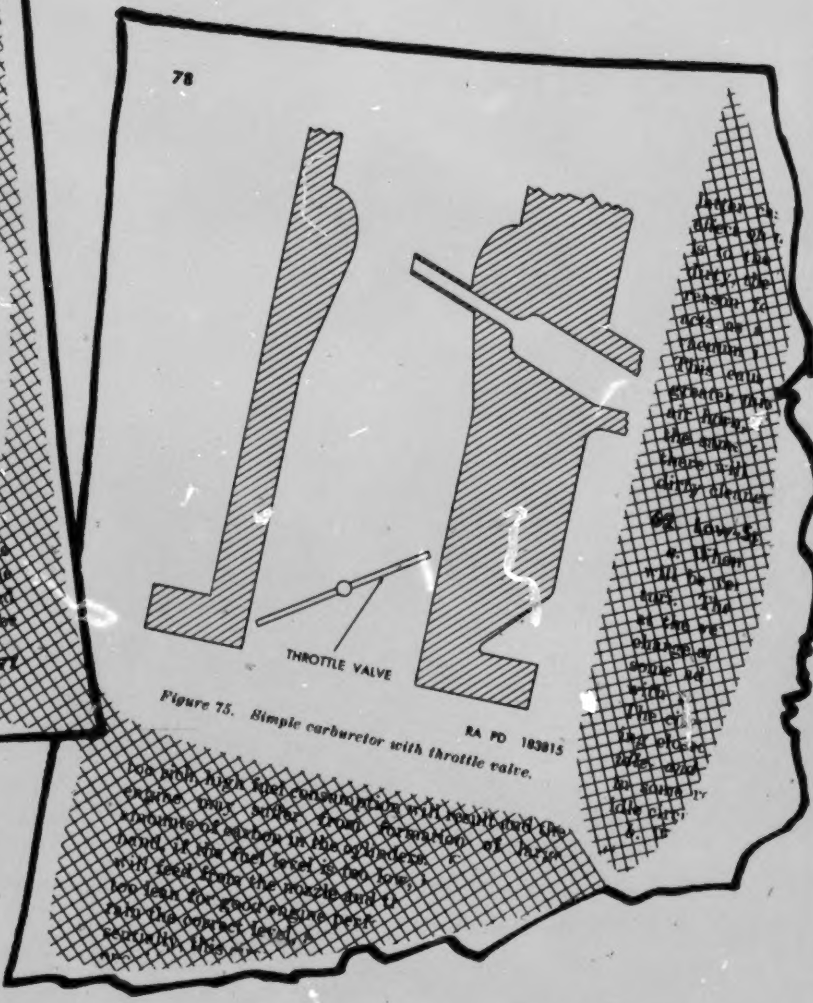
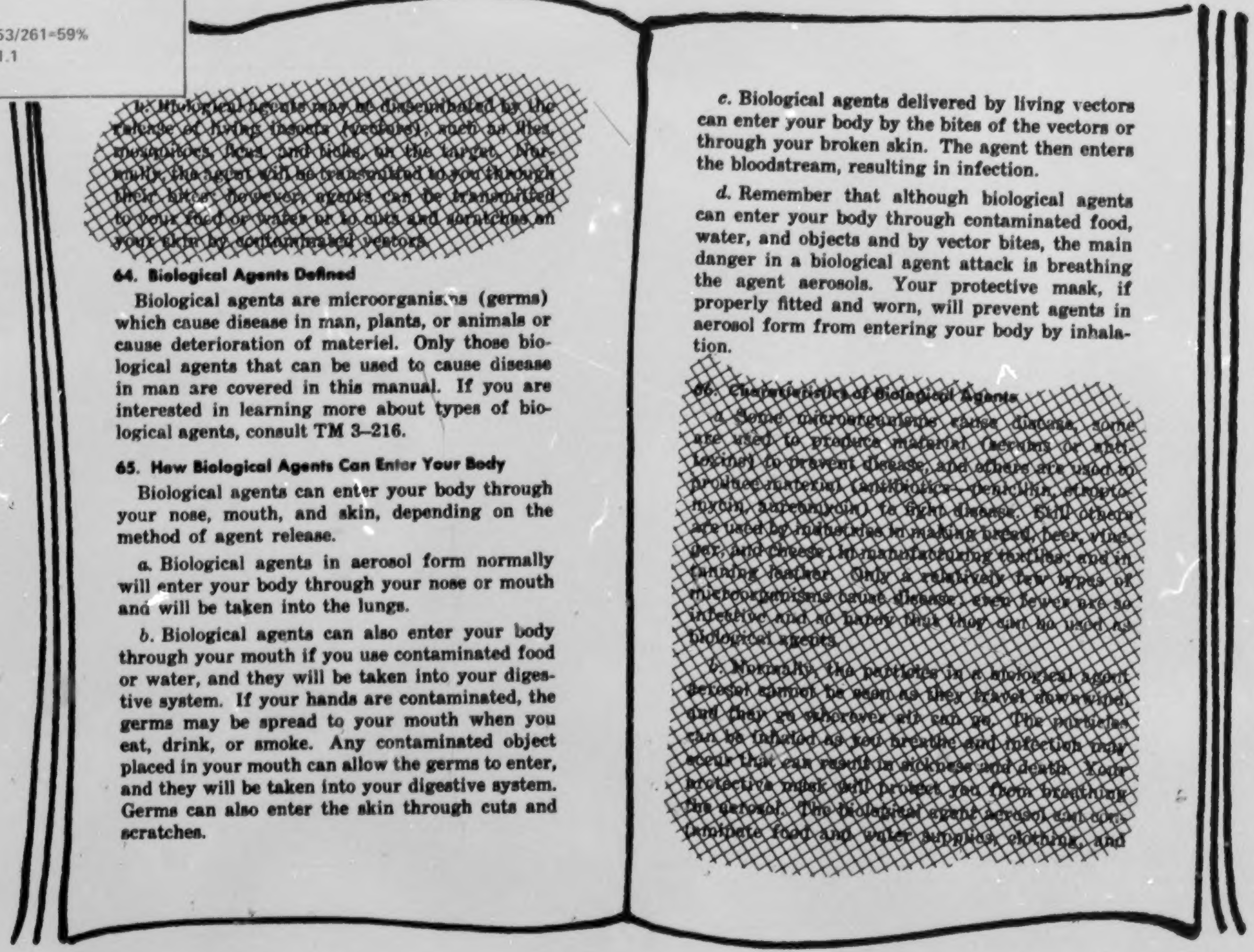


Figure 75. Simple carburetor with throttle valve.

Type of Literature: ORDNANCE - COMBAT
Rewrite Problem(s):
LONG SENTENCES
TOO WORDY

No. of 1 Syll. words/Total No. words: 153/261=59%
FORCAST Reading Grade Level Score: 11.1

BEFORE



b. Biological agents may be disseminated by the release of living insects (vectors), such as flies, mosquitoes, fleas, and ticks, on the target. Normally, the agent will be transmitted to you through their bites; however, agents can be transmitted to your food or water or to cuts and scratches on your skin by contaminated vectors.

64. Biological Agents Defined

Biological agents are microorganisms (germs) which cause disease in man, plants, or animals or cause deterioration of materiel. Only those biological agents that can be used to cause disease in man are covered in this manual. If you are interested in learning more about types of biological agents, consult TM 3–216.

65. How Biological Agents Can Enter Your Body

Biological agents can enter your body through your nose, mouth, and skin, depending on the method of agent release.

a. Biological agents in aerosol form normally will enter your body through your nose or mouth and will be taken into the lungs.

b. Biological agents can also enter your body through your mouth if you use contaminated food or water, and they will be taken into your digestive system. If your hands are contaminated, the germs may be spread to your mouth when you eat, drink, or smoke. Any contaminated object placed in your mouth can allow the germs to enter, and they will be taken into your digestive system. Germs can also enter the skin through cuts and scratches.

c. Biological agents delivered by living vectors can enter your body by the bites of the vectors or through your broken skin. The agent then enters the bloodstream, resulting in infection.

d. Remember that although biological agents can enter your body through contaminated food, water, and objects and by vector bites, the main danger in a biological agent attack is breathing the agent aerosols. Your protective mask, if properly fitted and worn, will prevent agents in aerosol form from entering your body by inhalation.

66. Characteristics of Biological Agents

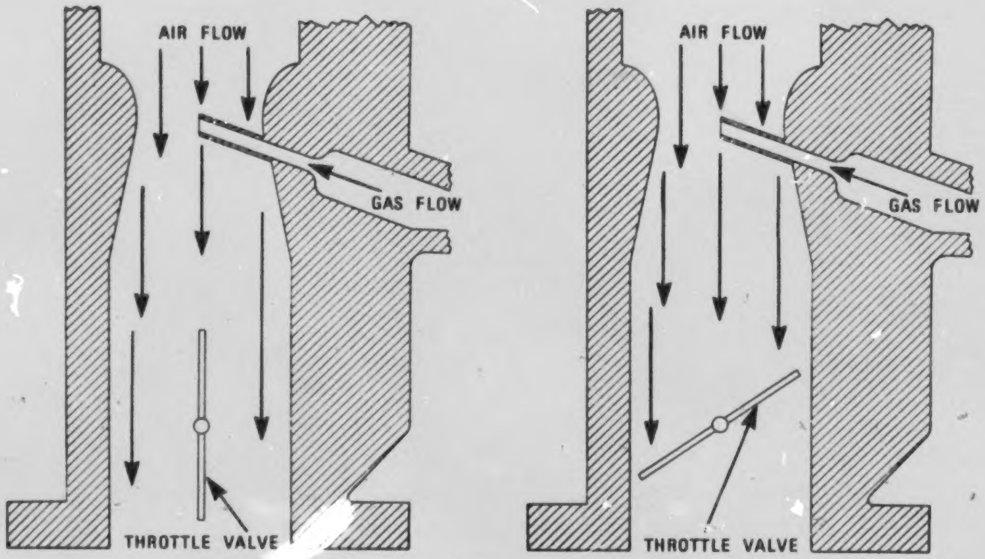
a. Some microorganisms cause disease, some are used to produce material (serums or antitoxins) to prevent disease, and others are used to produce material (antibiotics—penicillin, streptomycin, aureomycin) to fight disease. Still others are used by industries in making bread, beer, vinegar, and cheese, in manufacturing textiles, and in tanning leather. Only a relatively few types of microorganisms cause disease; even fewer are so infective and so hardy that they can be used as biological agents.

b. Normally, the particles in a biological agent aerosol cannot be seen as they travel downwind, and they go wherever air can go. The particles can be inhaled as you breathe and infection may occur that can result in sickness and death. Your protective mask will protect you from breathing the aerosol. The biological agent aerosol can contaminate food and water supplies, clothing, and

60. Throttle

The throttle valve is the most important control in the carburetor. It can change the amount of fuel-air mixture that enters the intake manifold. This disk or coin shaped valve is set on a shaft in the throat of the carburetor. As the shaft is turned the throttle valve tilts to open or close the throat.

When you step on the accelerator pedal the valve opens and lets a large amount of fuel-air mixture flow through the carburetor throat. The engine then produces lots of power. When you take your foot off the pedal the engine gets less fuel-air mixture and produces less power. Figure 75 shows you how the valve works.



a. More power

Push down on accelerator.
Throttle valve opens.
More fuel-air mixture flows through.
Engine provides more power.

b. Less power

Let up on accelerator.
Throttle valve closes.
Less fuel-air mixture flows through.
Engine provides less power.

Figure 75. **How the Throttle Valve Works in the Carburetor**

Type of Literature: ORDNANCE - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT IT IS - HOW IT DOES IT

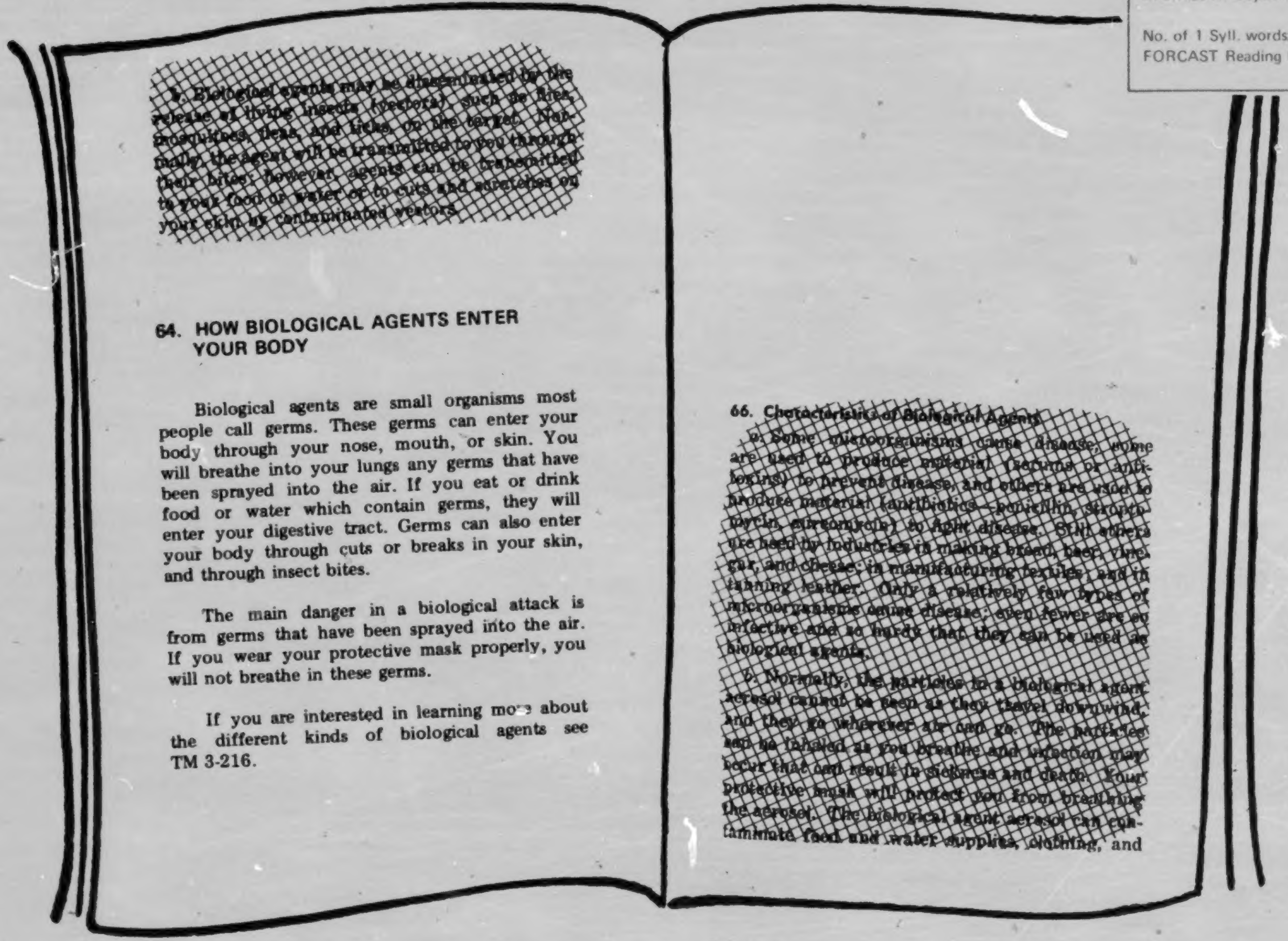
No. of 1 Syll. words/Total No. words: 81/112=72%
FORCAST Reading Grade Level Score: 9.2

AFTER

Type of Literature: **ORDNANCE - COMBAT**

Primary User: **WORKER**
Information Objectives: **WHAT IT IS - HOW IT DOES IT**

No. of 1 Syll. words/Total No. words: **89/124=72%**
FORCAST Reading Grade Level Score: **9.2**



b. Biological agents may be disseminated by the release of living insects (vectors), such as flies, mosquitoes, fleas, and ticks, on the target. Normally, the agent will be transmitted to you through their bites; however, agents can be transmitted to your food or water or to cuts and scratches on your skin by contaminated vectors.

64. HOW BIOLOGICAL AGENTS ENTER YOUR BODY

Biological agents are small organisms most people call germs. These germs can enter your body through your nose, mouth, or skin. You will breathe into your lungs any germs that have been sprayed into the air. If you eat or drink food or water which contain germs, they will enter your digestive tract. Germs can also enter your body through cuts or breaks in your skin, and through insect bites.

The main danger in a biological attack is from germs that have been sprayed into the air. If you wear your protective mask properly, you will not breathe in these germs.

If you are interested in learning more about the different kinds of biological agents see TM 3-216.

66. Characteristics of Biological Agents

a. Some microorganisms cause disease, some are used to produce material (serums or antitoxins) to prevent disease, and others are used to produce material (antibiotics—penicillin, streptomycin, aureomycin) to fight disease. Still others are used by industries in making bread, beer, vinegar, and cheese; in manufacturing textiles; and in tanning leather. Only a relatively few types of microorganisms cause disease; even fewer are so infective and so hardy that they can be used as biological agents.

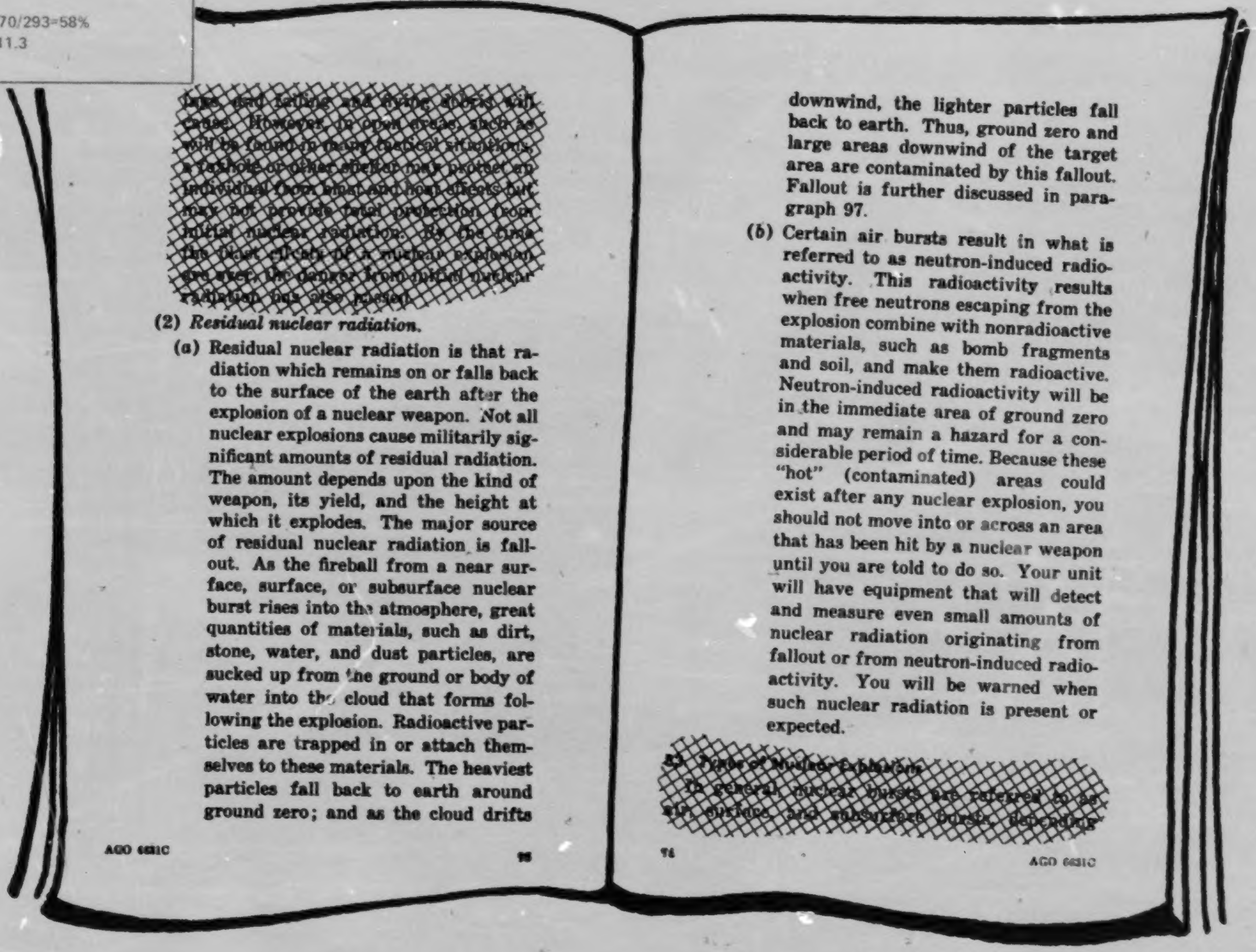
b. Normally, the particles in a biological agent aerosol cannot be seen as they travel downwind, and they go wherever air can go. The particles can be inhaled as you breathe and infection may occur that can result in sickness and death. Your protective mask will protect you from breathing the aerosol. The biological agent aerosol can contaminate food and water supplies, clothing, and

A
F
T
E
R

Type of Literature: ORDNANCE - COMBAT
Rewrite Problem(s):
TOO WORDY
RUN-TOGETHER FORMAT

No. of 1 Syll. words/Total No. words: 170/293=58%
FORCAST Reading Grade Level Score: 11.3

BEFORE



[illegible], and falling and flying debris will cause. However, in open areas, such as will be found in many tactical situations, a foxhole or other shelter may protect an individual from blast and heat effects but may not provide total protection from initial nuclear radiation. By the time the blast effects of a nuclear explosion are over, the danger from initial nuclear radiation has also passed.

(2) *Residual nuclear radiation.*

(a) Residual nuclear radiation is that radiation which remains on or falls back to the surface of the earth after the explosion of a nuclear weapon. Not all nuclear explosions cause militarily significant amounts of residual radiation. The amount depends upon the kind of weapon, its yield, and the height at which it explodes. The major source of residual nuclear radiation is fallout. As the fireball from a near surface, surface, or subsurface nuclear burst rises into the atmosphere, great quantities of materials, such as dirt, stone, water, and dust particles, are sucked up from the ground or body of water into the cloud that forms following the explosion. Radioactive particles are trapped in or attach themselves to these materials. The heaviest particles fall back to earth around ground zero; and as the cloud drifts downwind, the lighter particles fall back to earth. Thus, ground zero and large areas downwind of the target area are contaminated by this fallout. Fallout is further discussed in paragraph 97.

(b) Certain air bursts result in what is referred to as neutron-induced radioactivity. This radioactivity results when free neutrons escaping from the explosion combine with nonradioactive materials, such as bomb fragments and soil, and make them radioactive. Neutron-induced radioactivity will be in the immediate area of ground zero and may remain a hazard for a considerable period of time. Because these "hot" (contaminated) areas could exist after any nuclear explosion, you should not move into or across an area that has been hit by a nuclear weapon until you are told to do so. Your unit will have equipment that will detect and measure even small amounts of nuclear radiation originating from fallout or from neutron-induced radioactivity. You will be warned when such nuclear radiation is present or expected.

83. Types of Nuclear Explosions

In general, nuclear bursts are referred to as air, surface, and subsurface bursts, depending

AGO 6631C 75

76 AGO 6631C

221

222

Residual Nuclear Radiation

Radiation that is found in an area after a nuclear explosion is called residual radiation. This radiation may come from fallout, or it may be caused by what is called neutron-induced radioactivity.

Most residual radiation comes from *fallout*. A nuclear blast that is set off close to the surface of the ground will suck up large amounts of dirt, water, and other materials into the cloud that forms after the blast. Radioactive particles from the burst become attached to this dirt and other loose materials. This makes them radioactive. These materials begin to fall back to earth, landing near ground zero. They continue to fall out of the air as the cloud drifts away from ground zero, and are spread over a large area of land.

Certain air bursts cause what is called *neutron-induced radioactivity*. This type of radioactivity may be found close to ground zero and may be dangerous for a long time after the blast.

Not all nuclear blasts cause the same amount of residual radiation. The kind of weapon, its yield and the height at which it explodes determines the amount of radiation it leaves behind. Your unit will have equipment that will detect and measure even small amounts of radiation from fallout as well as from neutron-induced radioactivity. You should never go into an area that was hit by a nuclear blast until you are told to do so.

Type of Literature: **ORDNANCE - COMBAT**

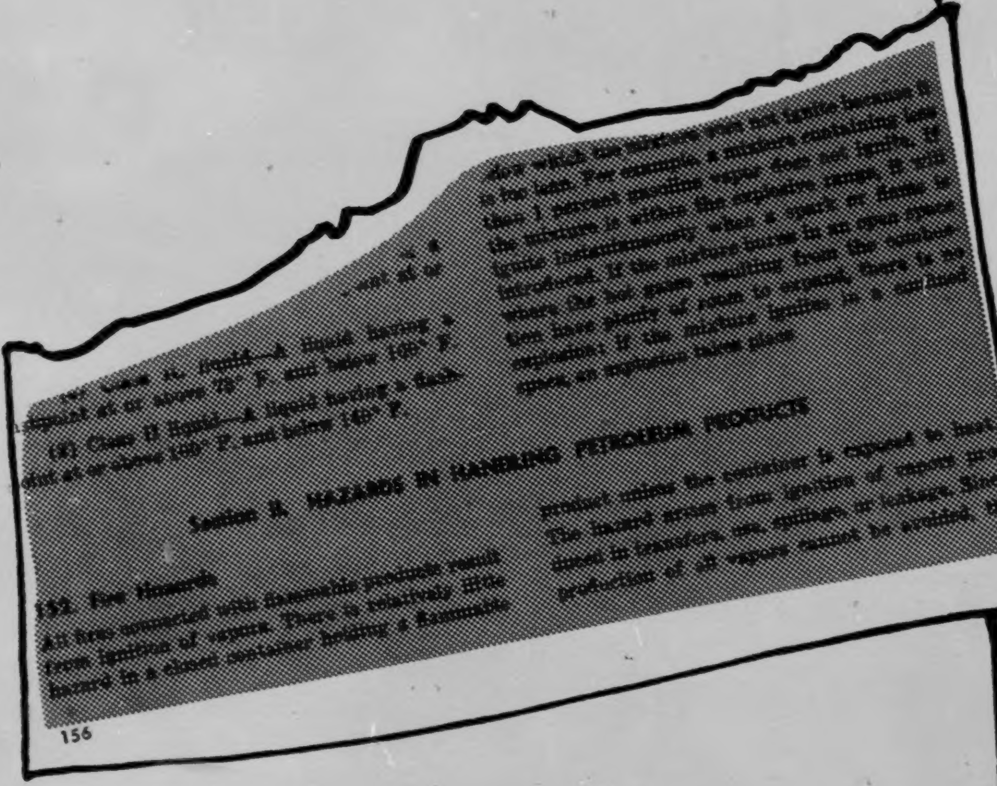
Primary User: **WORKER**
Information Objectives: **WHAT IT IS**

No. of 1 Syll. words/Total No. words: **163/233=70%**
FORCAST Reading Grade Level Score: **9.5**

AFTER

Type of Literature: QUARTERMASTER - TECHNICAL
Rewrite Problem(s):
HARD WORDS TOO WORDY
NOT DIRECT CONFUSING
TOO VAGUE RUN-TOGETHER FORMAT
No. of 1 Syll. words/Total No. words: 156/284=55%
FORCAST Reading Grade Level Score: 11.7

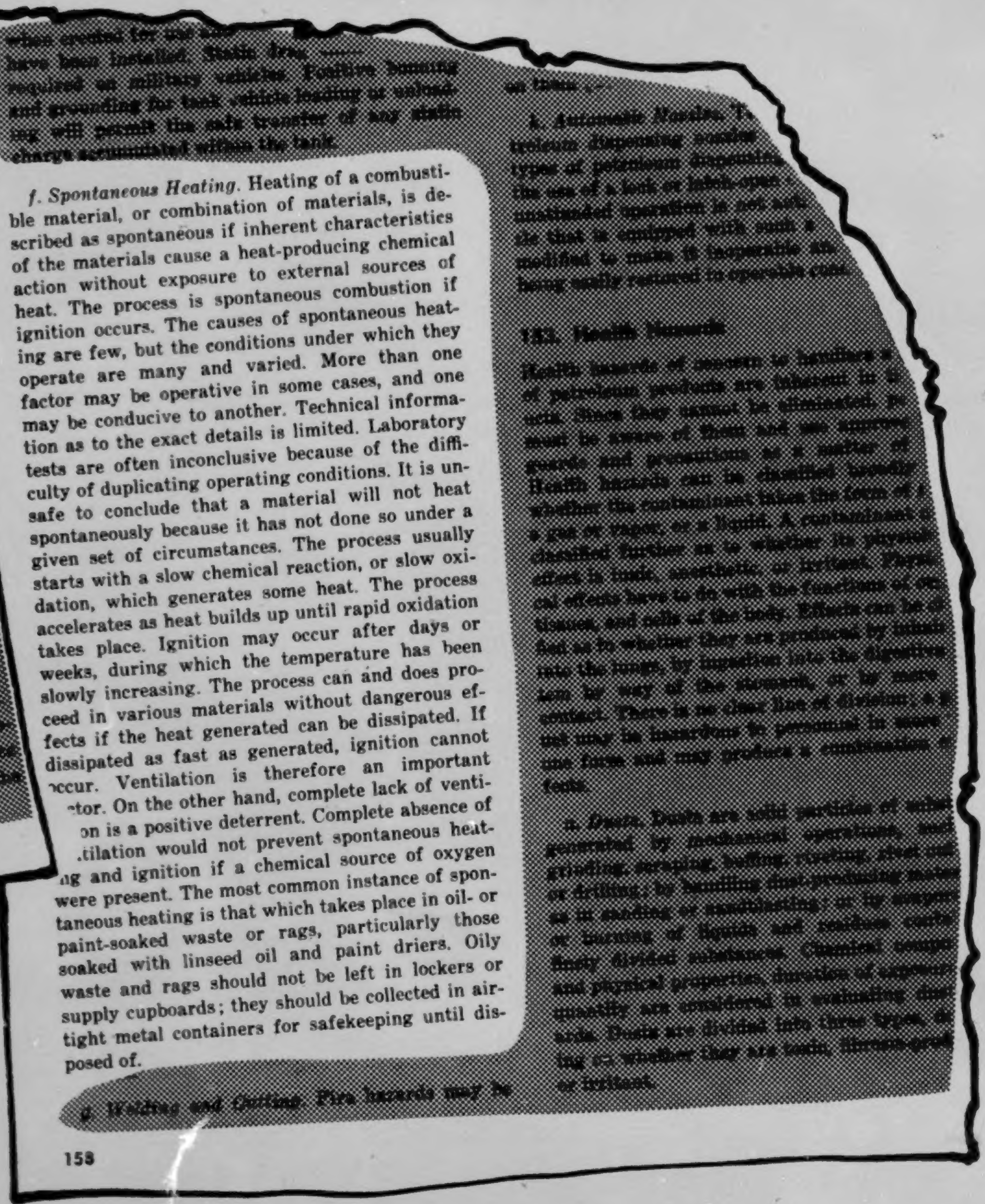
BEFORE



Section II. HAZARDS IN HANDLING PETROLEUM PRODUCTS

152. Fire Hazards

156



f. Spontaneous Heating. Heating of a combustible material, or combination of materials, is described as spontaneous if inherent characteristics of the materials cause a heat-producing chemical action without exposure to external sources of heat. The process is spontaneous combustion if ignition occurs. The causes of spontaneous heating are few, but the conditions under which they operate are many and varied. More than one factor may be operative in some cases, and one may be conducive to another. Technical information as to the exact details is limited. Laboratory tests are often inconclusive because of the difficulty of duplicating operating conditions. It is unsafe to conclude that a material will not heat spontaneously because it has not done so under a given set of circumstances. The process usually starts with a slow chemical reaction, or slow oxidation, which generates some heat. The process accelerates as heat builds up until rapid oxidation takes place. Ignition may occur after days or weeks, during which the temperature has been slowly increasing. The process can and does proceed in various materials without dangerous effects if the heat generated can be dissipated. If dissipated as fast as generated, ignition cannot ccur. Ventilation is therefore an important tor. On the other hand, complete lack of venti- on is a positive deterrent. Complete absence of tilation would not prevent spontaneous heat- ng and ignition if a chemical source of oxygen were present. The most common instance of spontaneous heating is that which takes place in oil- or paint-soaked waste or rags, particularly those soaked with linseed oil and paint driers. Oily waste and rags should not be left in lockers or air-supply cupboards; they should be collected in airtight metal containers for safekeeping until disposed of.

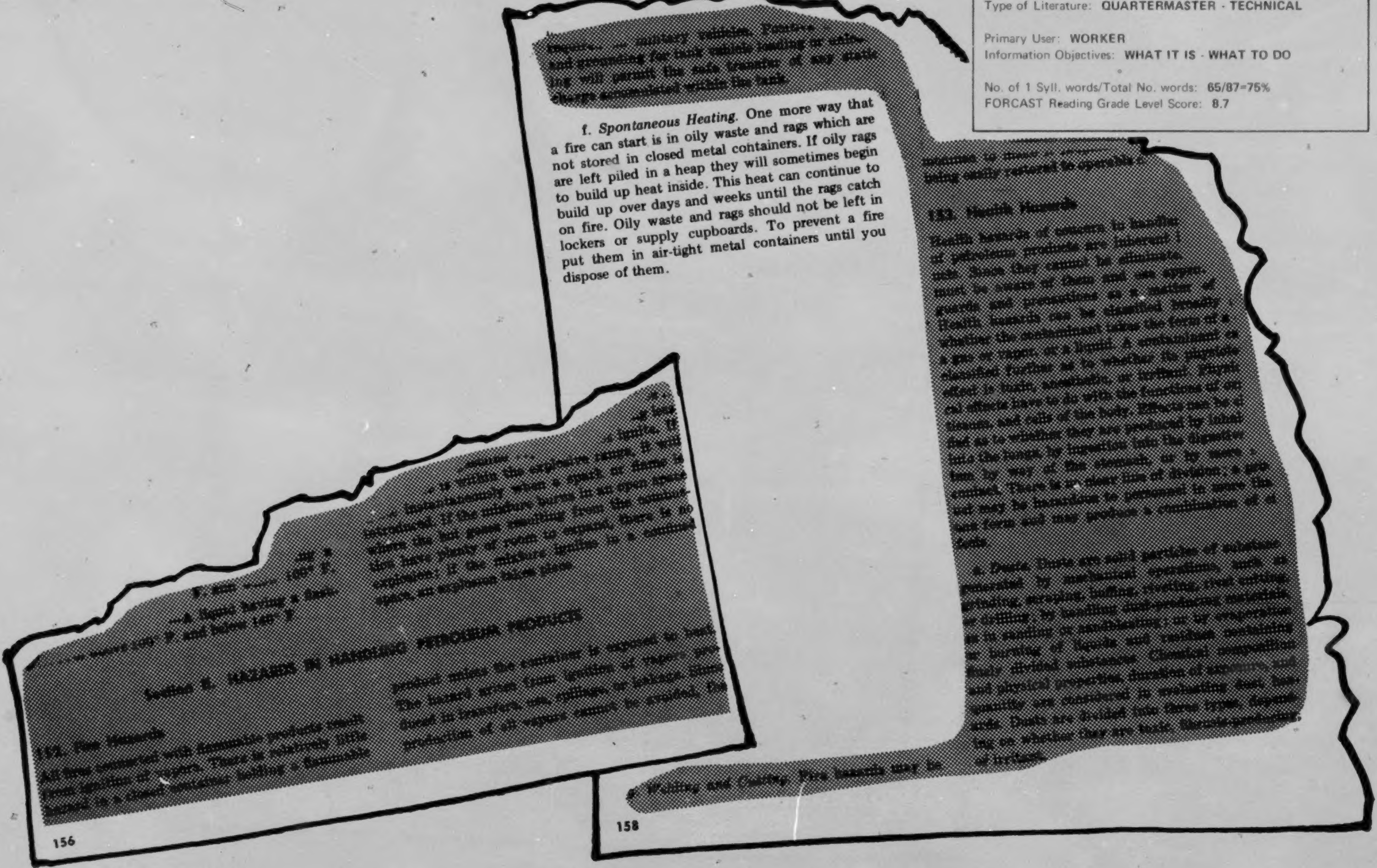
g. Welding and Cutting. Fire hazards may be

158

Type of Literature: **QUARTERMASTER - TECHNICAL**

Primary User: **WORKER**
Information Objectives: **WHAT IT IS - WHAT TO DO**

No. of 1 Syll. words/Total No. words: **65/87=75%**
FORCAST Reading Grade Level Score: **8.7**



f. *Spontaneous Heating.* One more way that a fire can start is in oily waste and rags which are not stored in closed metal containers. If oily rags are left piled in a heap they will sometimes begin to build up heat inside. This heat can continue to build up over days and weeks until the rags catch on fire. Oily waste and rags should not be left in lockers or supply cupboards. To prevent a fire put them in air-tight metal containers until you dispose of them.

156

158

AFTER

Type of Literature: **QUARTERMASTER - TECHNICAL**
Rewrite Problem(s):
LONG SENTENCES
NOT DIRECT
TOO WORDY
No. of 1 Syll. words/Total No. words: **178/304=59%**
FORCAST Reading Grade Level Score: **11.1**

BEFORE

[redacted]

d. *Dry-Bulb and Wet-Bulb Thermometers.* The dry- and wet-bulb thermometers (fig. 48) are used to measure the temperature and humidity of the fermentation room and the proofbox. The thermometers, two identical glass tubes, are mounted a few inches apart on a common base. The wet bulb has one end of a cloth wick tied around the bulb with the other end extending down where it is immersed in a tube of distilled water. The principle on which this thermometer operates to show the relative humidity of the atmosphere is based on the fact that when water or any other liquid evaporates it has a cooling effect, and the faster evaporation takes place, the greater the cooling effect. This point may be illustrated by wetting the hand with alcohol. Alcohol evaporates quickly, thereby producing a cooling effect or sensation. Because of the cooling effect of the evaporation of the water, the wet-bulb thermometer will ordinarily read lower than the dry-bulb thermometer. The difference in the readings of the two thermometers at any one time depends upon the rate of the evaporation of the water surrounding the wick of the wet-bulb thermometer. Water evaporates faster in dry air than it does in humid air. Therefore, the drier the atmosphere, the faster the water will evaporate from the wick of the wet-bulb thermometer causing a greater cooling effect. This cooling effect causes the difference between the readings on the dry bulb and the wet bulb. However, if the atmosphere is very humid, evaporation will take place slower, causing a lower cooling effect and allowing for the slight difference between the two thermometer readings. If the air is saturated with moisture, the two thermometers will read the same and the relative humidity will be 100 percent. (For method of reading the percent of relative humidity, refer to paragraph 99*d*.)

[redacted]

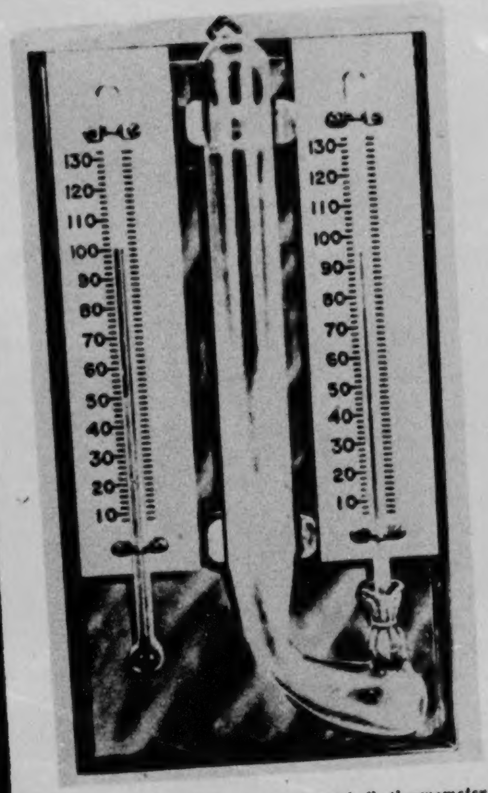


Figure 48. Dry-bulb and wet-bulb thermometer.

Type of Literature: **QUARTERMASTER - TECHNICAL**

Primary User: **WORKER**
Information Objectives: **WHAT IT'S FOR - HOW IT DOES IT**

No. of 1 Syll. words/Total No. words: **158/226=70%**
FORCAST Reading Grade Level Score: **9.5**

[redacted]

[redacted]

d. *Dry-bulb and wet-bulb thermometer.*

You use the dry- and wet-bulb thermometer to measure the temperature and humidity of the fermentation room and the proofbox. Dough ferments best when the temperature is 80°F and the humidity is 75%. Dough is proofed best when the temperature is between 90° and 100°F and the humidity 80 to 85 percent. To bake good bread, you must be sure that you have the right conditions in the fermentation room and in the proofbox.

The thermometers are identical glass tubes which are set a few inches apart on the same base. (See Figure 48.) The wet-bulb thermometer has one end of a cloth wick tied around its bulb. The other end of the wick sits in a tube of distilled water. As the water evaporates from the wick, it cools the bulb. Now the temperature reading on the wet-bulb thermometer is less than the reading on the dry-bulb thermometer. In dry air the water evaporates fast to cool the bulb a lot. This makes a large difference in the two readings. In wet air the water evaporates slowly and there will be a smaller difference in the two readings. The difference in the readings tells you how much water is in the air. The percent of water in the air or relative humidity is found with Table 5, page 85.

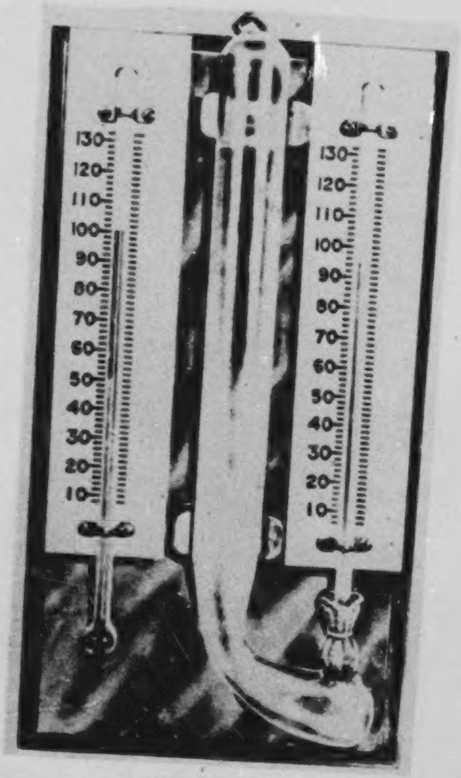


Figure 48. Dry-bulb and wet-bulb thermometer.

[redacted]

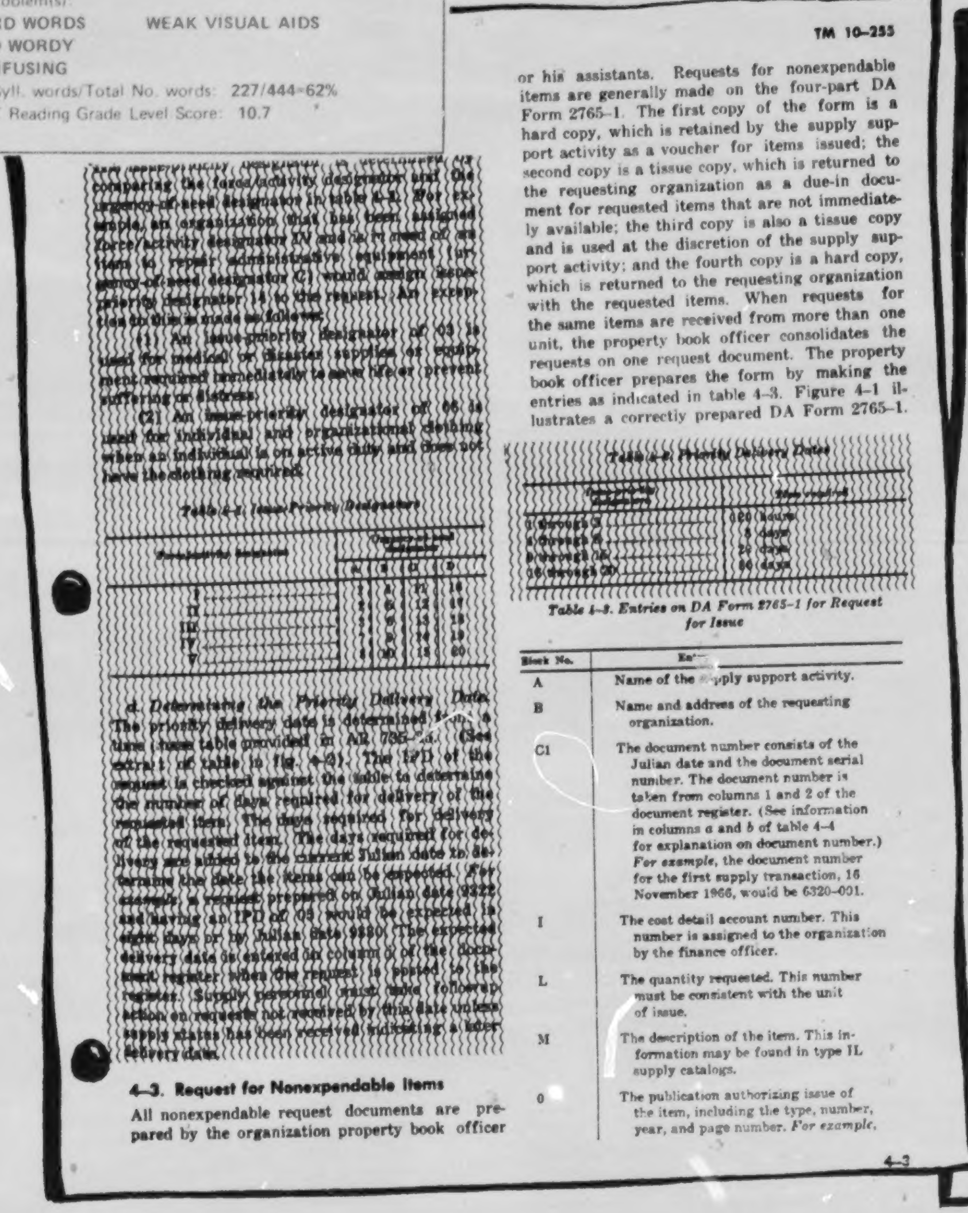
AFTER

231

232

Type of Literature: QUARTERMASTER ADMINISTRATIVE
Rewrite Problem(s):
✓ HARD WORDS WEAK VISUAL AIDS
TOO WORDY
CONFUSING
No. of 1 Syll. words/Total No. words: 227/444=62%
FORCAST Reading Grade Level Score: 10.7

BEFORE



issue-priority designator is developed by comparing the force/activity designator and the urgency-of-need designator in table 4-1. For example, an organization that has been assigned force/activity designator IV and is in need of an item to repair administrative equipment (urgency-of-need designator C) would assign issue-priority designator 14 to the request. An exception to this is made as follows:

(1) An issue-priority designator of 03 is used for medical or disaster supplies or equipment required immediately to save life or prevent suffering or distress.

(2) An issue-priority designator of 06 is used for individual and organizational clothing when an individual is on active duty and does not have the clothing required.

Table 4-1. Issue-Priority Designators

Force/activity designator	Urgency-of-need designator			
	A	B	C	D
I	1	4	11	16
II	2	5	12	17
III	3	6	13	18
IV	7	9	14	19
V	8	10	15	20

d. *Determining the Priority Delivery Date.* The priority delivery date is determined from a time base table provided in AR 735-35. (See extract of table in fig. 4-2.) The IPD of the request is checked against the table to determine the number of days required for delivery of the requested item. The days required for delivery of the requested item. The days required for delivery are added to the current Julian date to determine the date the items can be expected. *For example*, a request prepared on Julian date 9322 and having an IPD of 05 would be expected in eight days or by Julian date 9330. The expected delivery date is entered in column g of the document register when the request is posted to the register. Supply personnel must take followup action on requests not received by this date unless supply status has been received indicating a later delivery date.

4-3. Request for Nonexpendable Items

All nonexpendable request documents are prepared by the organization property book officer or his assistants. Requests for nonexpendable items are generally made on the four-part DA Form 2765-1. The first copy of the form is a hard copy, which is retained by the supply support activity as a voucher for items issued; the second copy is a tissue copy, which is returned to the requesting organization as a due-in document for requested items that are not immediately available; the third copy is also a tissue copy and is used at the discretion of the supply support activity; and the fourth copy is a hard copy, which is returned to the requesting organization with the requested items. When requests for the same items are received from more than one unit, the property book officer consolidates the requests on one request document. The property book officer prepares the form by making the entries as indicated in table 4-3. Figure 4-1 illustrates a correctly prepared DA Form 2765-1.

Table 4-2. Priority Delivery Dates

Issue-priority designator	Time required
01 through 03	120 hours
04 through 08	8 days
09 through 15	20 days
16 through 20	60 days

Table 4-3. Entries on DA Form 2765-1 for Request for Issue

Block No.	Entry
A	Name of the supply support activity.
B	Name and address of the requesting organization.
C1	The document number consists of the Julian date and the document serial number. The document number is taken from columns 1 and 2 of the document register. (See information in columns *a* and *b* of table 4-4 for explanation on document number.) *For example*, the document number for the first supply transaction, 16 November 1966, would be 6320-001.
I	The cost detail account number. This number is assigned to the organization by the finance officer.
L	The quantity requested. This number must be consistent with the unit of issue.
M	The description of the item. This information may be found in type IL supply catalogs.
0	The publication authorizing issue of the item, including the type, number, year, and page number. *For example*,

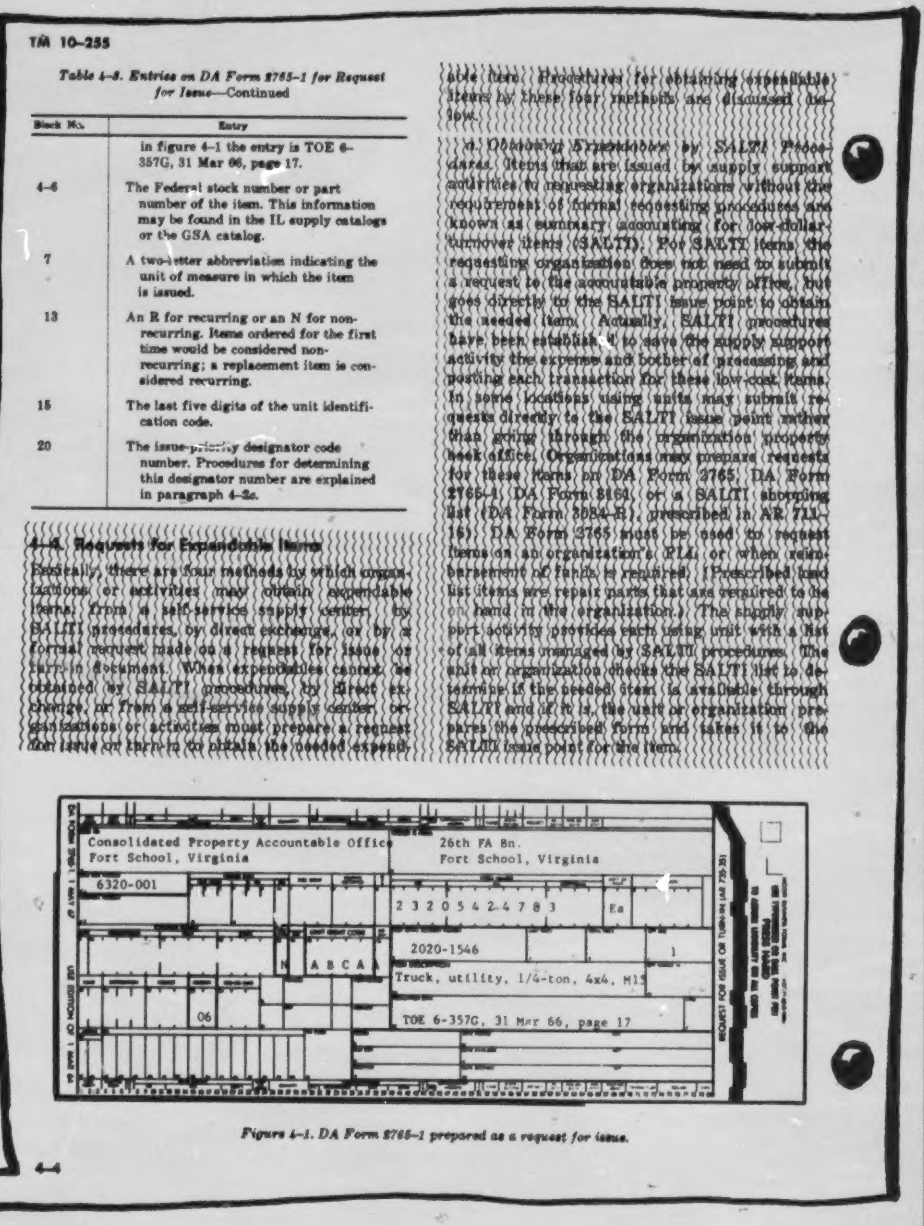


Table 4-3. Entries on DA Form 2765-1 for Request for Issue—Continued

Block No.	Entry
	in figure 4-1 the entry is TOE 6-357G, 31 Mar 66, page 17.
4-6	The Federal stock number or part number of the item. This information may be found in the IL supply catalogs or the GSA catalog.
7	A two-letter abbreviation indicating the unit of measure in which the item is issued.
13	An R for recurring or an N for nonrecurring. Items ordered for the first time would be considered nonrecurring; a replacement item is considered recurring.
15	The last five digits of the unit identification code.
20	The issue-priority designator code number. Procedures for determining this designator number are explained in paragraph 4-2c.

4-4. Requests for Expendable Items

Basically, there are four methods by which organizations or activities may obtain expendable items: from a self-service supply center, by SALTI procedures, by direct exchange, or by a formal request made on a request for issue or turn-in document. When expendables cannot be obtained by SALTI procedures, by direct exchange, or from a self-service supply center, organizations or activities must prepare a request for issue or turn-in to obtain the needed expendable item. Procedures for obtaining expendable items by these four methods are discussed below.

a. *Obtaining Expendables by SALTI Procedures.* Items that are issued by supply support activities to requesting organizations without the requirement of formal requesting procedures are known as summary accounting for low-dollar-turnover items (SALTI). For SALTI items the requesting organization does not need to submit a request to the accountable property office, but goes directly to the SALTI issue point to obtain the needed item. Actually, SALTI procedures have been established to save the supply support activity the expense and bother of processing and posting each transaction for these low-cost items. In some locations using units may submit requests directly to the SALTI issue point rather than going through the organization property book office. Organizations may prepare requests for these items on DA Form 2765, DA Form 2765-1, DA Form 3161, or a SALTI shopping list (DA Form 3084-R), prescribed in AR 711-16. DA Form 2765 must be used to request items on an organization's PLL or when reimbursement of funds is required. (Prescribed load list items are repair parts that are required to be on hand in the organization.) The supply support activity provides each using unit with a list of all items managed by SALTI procedures. The unit or organization checks the SALTI list to determine if the needed item is available through SALTI and if it is, the unit or organization prepares the prescribed form and takes it to the SALTI issue point for the item.

Consolidated Property Accountable Office
Fort School, Virginia

26th FA Bn.
Fort School, Virginia

6320-001

2 3 2 0 5 4 2-4 7 8 3

Ea

2020-1546

1

N

A B C A

Truck, utility, 1/4-ton, 4x4, M15

06

TOE 6-357G, 31 Mar 66, page 17

Figure 4-1. DA Form 2765-1 prepared as a request for issue.

Type of Literature: QUARTERMASTER - ADMINISTRATIVE

Primary User: WORKER
Information Objectives: HOW TO DO IT

No. of 1 Syll. words/Total No. words: 324/509=64%
FORCAST Reading Grade Level Score: 10.4

force activity designator IV and is in need of an item to repair administrative equipment (urgency-of-need designator C) would assign issue-priority designator 14 to the request. An exception to this is made as follows:

(1) An issue-priority designator of 03 is used for medical or disaster supplies or equipment required immediately to save life or prevent suffering or distress.

(2) An issue-priority designator of 08 is used for individual and organizational clothing when an individual is on active duty and does not have the clothing required.

d. Determining the Priority Delivery Date. The priority delivery date is determined from a time phase table provided in AR 735-35. (See extract of table in fig. 4-20). The IPD of the request is checked against the table to determine the number of days required for delivery of the requested item. The days required for delivery of the requested item. The days required for delivery are added to the current Julian date to determine the date the items can be expected. For example, a request prepared on Julian date 9322 and having an IPD of 06 would be expected in eight days or by Julian date 9330. The expected delivery date is entered in column j of the document register when the request is posted to the register. Supply personnel must take followup action on requests not received by this date unless supply status has been received indicating a later delivery date.

HOW TO FILL OUT A REQUEST FOR NONEXPENDABLE ITEMS (DA Form 2765-1)

a. *Who fills out the request:*
It is filled out by the organization property book officer or his assistants.

b. *What form to use?*
Use DA Form 2765-1. Keep all four copies of the form together. All four will be sent with the request.

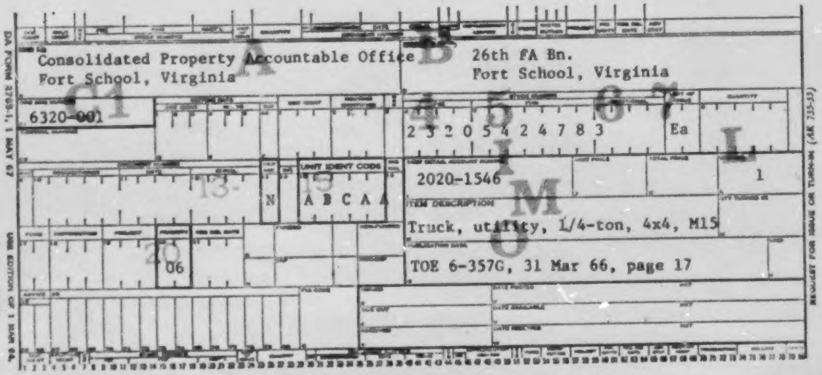
c. *How to fill out the request.*
(1) Use a new request for each different item.

(2) Check to see if there are requests for the same item from more than one unit.

(3) If so, combine all the requests for the same item on one request form.

(4) Have at hand the Document Register (DA Form 2064) which keeps a record of the requests for nonexpendable items.

(5) Fill in the blocks listed below. Figure 4-1 shows a form which has been correctly filled out.



A
B
C1
4
5
6
7
L
I
M
O
13
15
20
DA FORM 2765-1, 1 MAY 67
USE EDITION OF 1 MAR 64.
REQUEST FOR ISSUE OR TURN-IN (AR 735-35)
UNIT IDENT CODE
ITEM DESCRIPTION

Consolidated Property Accountable Office
Fort School, Virginia

26th FA Bn.
Fort School, Virginia

6320-001

2 3 2 0 5 4 2 4 7 8 3

Ea

2020-1546

1

N

A B C A A

Truck, utility, 1/4-ton, 4x4, M15

06

TOE 6-357G, 31 Mar 66, page 17

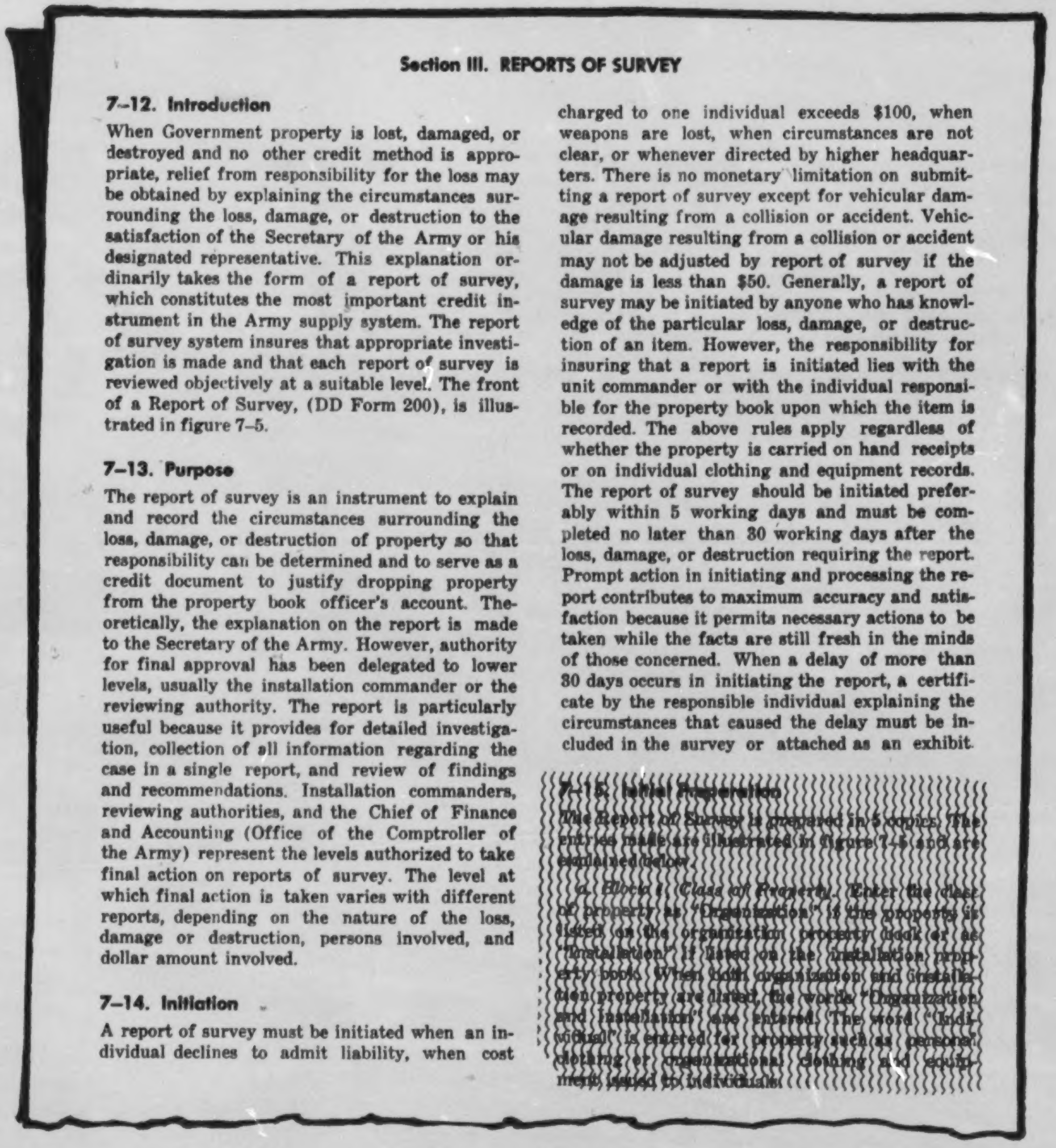
Figure 4-1. DA Form 2765-1 prepared as a request for issue.

Block No.	Entry
A, Send To:	Name of the supply point which issues you the item.
B, Request is From:	Name and address of your organization.
C1, Org Doc Number.	The Julian date and the three number document serial
	NOTE: To get the Julian date, you can use the Julian date conversion table on page 4-12. The first number is the last number of the calendar year. The last three numbers show the day of the year, 001 to 365. To get the document serial number, enter the serial number from column b of the Document Register (DA Form 2064). The first entry for each day on the Document Register is 001, the second is 002, and so on. For example, the document number for the first supply transaction, 16 November 1966, would be 6320-001.
4-6, Stock Number	The Federal stock or part number of the item. Find this number in the IL supply catalogs or the GSA catalog.
7, Unit of Issué.	The unit in which the item is issued. Use the two-letter abbreviation given in the supply catalog.
13, Demand.	Either R (for recurring) or N (for nonrecurring).
	NOTE: If you order the item for the FIRST TIME, it is Nonrecurring. If you order a REPLACEMENT item, it is Recurring.
15, Unit Ident Code.	The last five numbers of the unit identification code. Each unit has its own identification code. Know yours.
20, Priority.	The issue priority code (01 to 20)
	NOTE: To find the issue priority code, you must first know the force/activity code given to your unit (I to V) and the urgency-of-need code for the item (A to D). If you do not know the issue priority code, check AR 725-50.
I, Cost Detail Account Number.	Each organization has a cost detail number, which has been assigned by the finance officer. Know yours.
L, Qty Req.	The quantity requested; how much you are requesting.
	NOTE: Make sure that your request is in the same units as the unit of issue.
M, Item Description.	A description of the item. You can find this in the IL supply catalog.
O, Publication Data.	A record of the publication which authorizes the issue of the item. Give the type, number, year, and page number.

A
F
T
E
R

Type of Literature: QUARTERMASTER - ADMINISTRATIVE
Rewrite Problem(s): TOO VAGUE
HARD WORDS TOO WORDY
LONG SENTENCES CONFUSING
NOT DIRECT RUN-TOGETHER FORMAT
No. of 1 Syll. words/Total No. words: 279/532=52%
FORCAST Reading Grade Level Score: 12.2

BEFORE



Section III. REPORTS OF SURVEY

7–12. Introduction

When Government property is lost, damaged, or destroyed and no other credit method is appropriate, relief from responsibility for the loss may be obtained by explaining the circumstances surrounding the loss, damage, or destruction to the satisfaction of the Secretary of the Army or his designated representative. This explanation ordinarily takes the form of a report of survey, which constitutes the most important credit instrument in the Army supply system. The report of survey system insures that appropriate investigation is made and that each report of survey is reviewed objectively at a suitable level. The front of a Report of Survey, (DD Form 200), is illustrated in figure 7–5.

7–13. Purpose

The report of survey is an instrument to explain and record the circumstances surrounding the loss, damage, or destruction of property so that responsibility can be determined and to serve as a credit document to justify dropping property from the property book officer's account. Theoretically, the explanation on the report is made to the Secretary of the Army. However, authority for final approval has been delegated to lower levels, usually the installation commander or the reviewing authority. The report is particularly useful because it provides for detailed investigation, collection of all information regarding the case in a single report, and review of findings and recommendations. Installation commanders, reviewing authorities, and the Chief of Finance and Accounting (Office of the Comptroller of the Army) represent the levels authorized to take final action on reports of survey. The level at which final action is taken varies with different reports, depending on the nature of the loss, damage or destruction, persons involved, and dollar amount involved.

7–14. Initiation

A report of survey must be initiated when an individual declines to admit liability, when cost charged to one individual exceeds $100, when weapons are lost, when circumstances are not clear, or whenever directed by higher headquarters. There is no monetary limitation on submitting a report of survey except for vehicular damage resulting from a collision or accident. Vehicular damage resulting from a collision or accident may not be adjusted by report of survey if the damage is less than $50. Generally, a report of survey may be initiated by anyone who has knowledge of the particular loss, damage, or destruction of an item. However, the responsibility for insuring that a report is initiated lies with the unit commander or with the individual responsible for the property book upon which the item is recorded. The above rules apply regardless of whether the property is carried on hand receipts or on individual clothing and equipment records. The report of survey should be initiated preferably within 5 working days and must be completed no later than 30 working days after the loss, damage, or destruction requiring the report. Prompt action in initiating and processing the report contributes to maximum accuracy and satisfaction because it permits necessary actions to be taken while the facts are still fresh in the minds of those concerned. When a delay of more than 30 days occurs in initiating the report, a certificate by the responsible individual explaining the circumstances that caused the delay must be included in the survey or attached as an exhibit.

7–15. Initial Preparation

The Report of Survey is prepared in 5 copies. The entries made are illustrated in figure 7–5 and are explained below.

a. Block 1, Class of Property. Enter the class of property as "Organization" if the property is listed on the organization property book or as "Installation" if listed on the installation property book. When both organization and installation property are listed, the words "Organization and Installation" are entered. The word "Individual" is entered for property such as personal clothing or organizational clothing and equipment issued to individuals.

237

Type of Literature: QUARTERMASTER - ADMINISTRATIVE

Primary User: WORKER
Information Objectives: WHAT IT'S FOR - WHEN TO USE IT

No. of 1 Syll. words/Total No. words: 195/320=61%
FORCAST Reading Grade Level Score: 10.8

REPORTS OF SURVEY

7-12. WHAT A REPORT OF SURVEY DOES

The report of survey (DD Form 200) is the most important credit method in the Army supply system. When Government property is lost, damaged, or destroyed, the report of survey is used to explain and record what happened and can be used as a credit document. This lets the property book officer take the item off his property account.

a. *What is a report of survey used for?*
- (1) To record the details of the investigation of the loss.
- (2) To collect all the information about the case in a single report.
- (3) To review findings and recommendations.
- (4) To take a lost item off the property book.

b. *Who takes final action on the report?*
Final action may be taken by any of these levels:
- (1) The installation commander
- (2) The reviewing authorities
- (3) The Chief of Finance and Accounting (Office of the Comptroller of the Army)

The level depends on:
- (1) The nature of the loss.
- (2) The persons involved.
- (3) The amount of money involved.

7-13. FILING THE REPORT OF SURVEY

a. *Who should file the report?*
- (1) Anyone who knows an item is lost, damaged or destroyed.
- (2) The unit commander or person whose property book carries the item must be sure the report is filed. This is true even if property is carried on hand receipts or individual clothing and equipment records.

b. *When should you file a report of survey?*
- (1) Someone will not admit he is at fault for something that happened.
- (2) One person is charged costs of over $100.
- (3) A weapon is lost.
- (4) More than $50 damage is done to a vehicle in a collision or accident.
- (5) What really happened is not clear.
- (6) Headquarters says to do it.

c. *How soon should you file it?*
- (1) As soon as possible, but must be completed within 30 working days after loss.
- (2) If there is a delay of more than 30 working days the Property Book Officer must submit a written explanation of the delay along with the report.

7–13. Initial Preparation

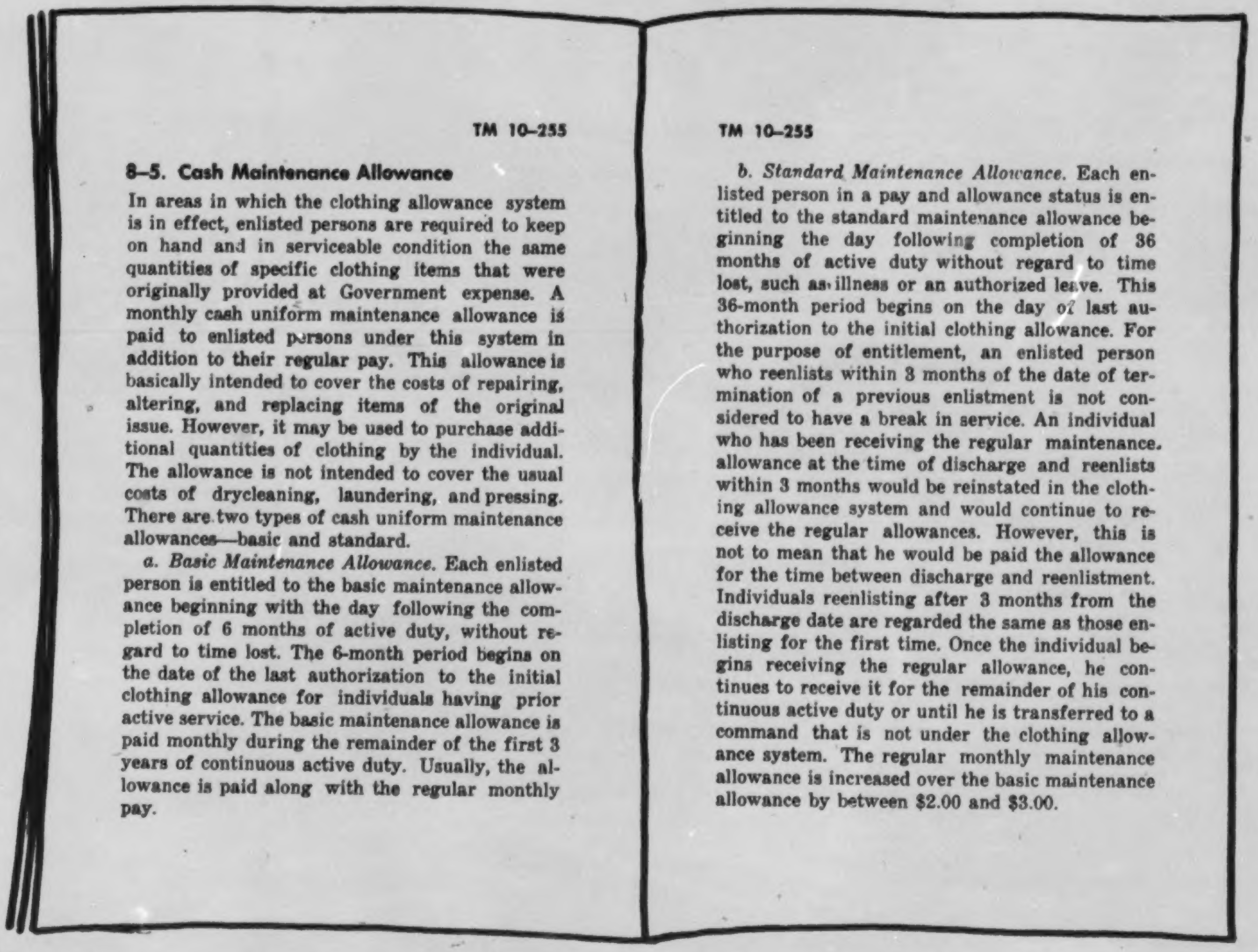
The Report of Survey is prepared in 5 copies. The entries made are illustrated in figure 7–5 and are explained below.

a. Block 1. Class of Property. Enter the class of property as "Organization" if the property is listed on the organization property book or as "Installation" if listed on the installation property book. When both organization and installation property are listed, the words "Organization and Installation" are entered. The word "Individual" is entered for property such as personal clothing or organizational clothing and equipment issued to individuals.

AFTER

Type of Literature: QUARTERMASTER - ADMINISTRATIVE
Rewrite Problem(s):
HARD WORDS TOO VAGUE
LONG SENTENCES CONFUSING
NOT DIRECT RUN-TOGETHER FORMAT
No. of 1 Syll. words/Total No. words: 244/428=52%
FORCAST Reading Grade Level Score: 12.2

BEFORE



8–5. Cash Maintenance Allowance

In areas in which the clothing allowance system is in effect, enlisted persons are required to keep on hand and in serviceable condition the same quantities of specific clothing items that were originally provided at Government expense. A monthly cash uniform maintenance allowance is paid to enlisted persons under this system in addition to their regular pay. This allowance is basically intended to cover the costs of repairing, altering, and replacing items of the original issue. However, it may be used to purchase additional quantities of clothing by the individual. The allowance is not intended to cover the usual costs of drycleaning, laundering, and pressing. There are two types of cash uniform maintenance allowances—basic and standard.

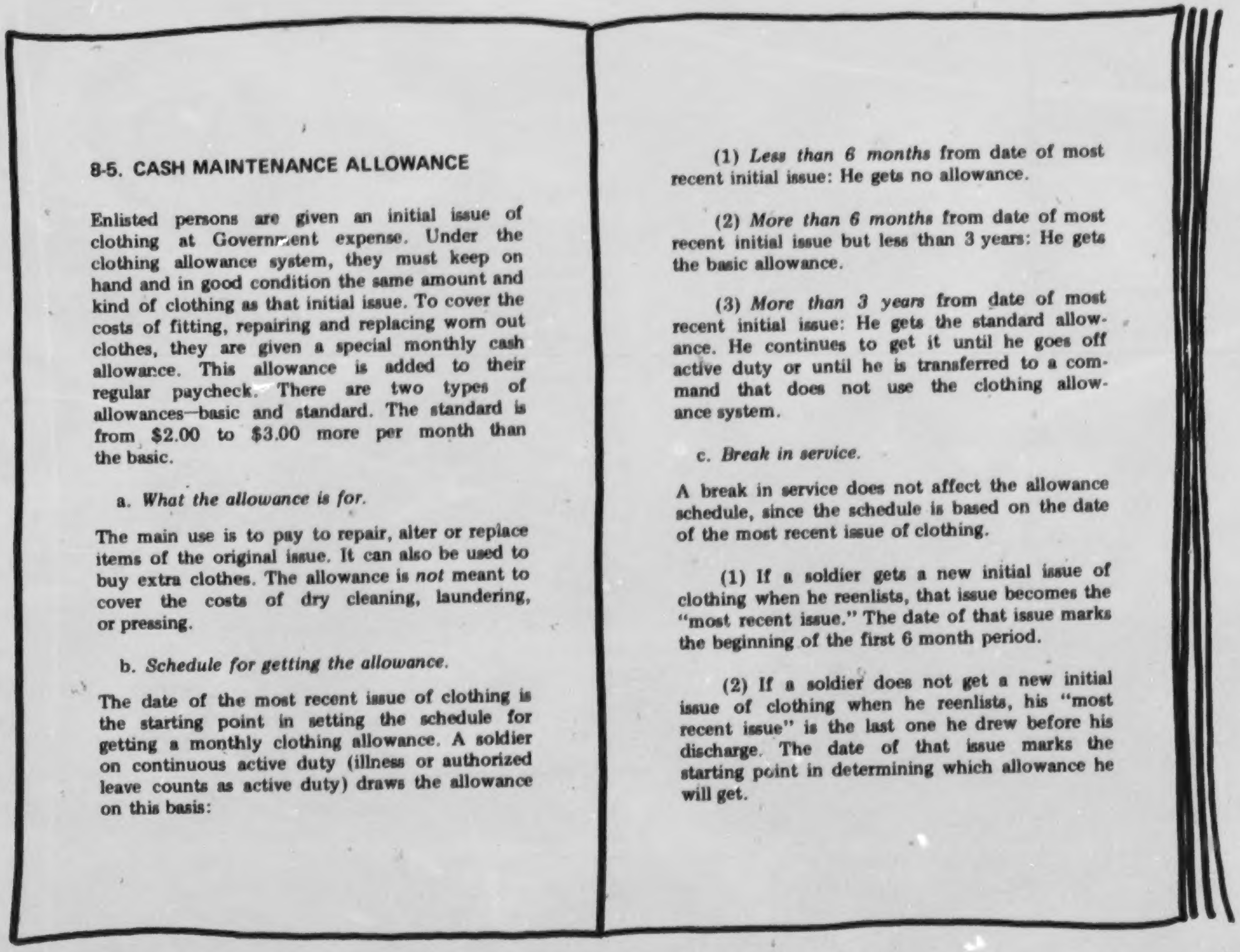
a. Basic Maintenance Allowance. Each enlisted person is entitled to the basic maintenance allowance beginning with the day following the completion of 6 months of active duty, without regard to time lost. The 6-month period begins on the date of the last authorization to the initial clothing allowance for individuals having prior active service. The basic maintenance allowance is paid monthly during the remainder of the first 3 years of continuous active duty. Usually, the allowance is paid along with the regular monthly pay.

b. Standard Maintenance Allowance. Each enlisted person in a pay and allowance status is entitled to the standard maintenance allowance beginning the day following completion of 36 months of active duty without regard to time lost, such as illness or an authorized leave. This 36-month period begins on the day of last authorization to the initial clothing allowance. For the purpose of entitlement, an enlisted person who reenlists within 3 months of the date of termination of a previous enlistment is not considered to have a break in service. An individual who has been receiving the regular maintenance allowance at the time of discharge and reenlists within 3 months would be reinstated in the clothing allowance system and would continue to receive the regular allowances. However, this is not to mean that he would be paid the allowance for the time between discharge and reenlistment. Individuals reenlisting after 3 months from the discharge date are regarded the same as those enlisting for the first time. Once the individual begins receiving the regular allowance, he continues to receive it for the remainder of his continuous active duty or until he is transferred to a command that is not under the clothing allowance system. The regular monthly maintenance allowance is increased over the basic maintenance allowance by between $2.00 and $3.00.

Type of Literature: **QUARTERMASTER - ADMINISTRATIVE**

Primary User: **WORKER**
Information Objectives: **WHAT IT IS - WHEN TO USE IT**

No. of 1 Syll. words/Total No. words: **233/365=64%**
FORCAST Reading Grade Level Score: **10.4**



8-5. CASH MAINTENANCE ALLOWANCE

Enlisted persons are given an initial issue of clothing at Government expense. Under the clothing allowance system, they must keep on hand and in good condition the same amount and kind of clothing as that initial issue. To cover the costs of fitting, repairing and replacing worn out clothes, they are given a special monthly cash allowance. This allowance is added to their regular paycheck. There are two types of allowances—basic and standard. The standard is from $2.00 to $3.00 more per month than the basic.

a. *What the allowance is for.*

The main use is to pay to repair, alter or replace items of the original issue. It can also be used to buy extra clothes. The allowance is *not* meant to cover the costs of dry cleaning, laundering, or pressing.

b. *Schedule for getting the allowance.*

The date of the most recent issue of clothing is the starting point in setting the schedule for getting a monthly clothing allowance. A soldier on continuous active duty (illness or authorized leave counts as active duty) draws the allowance on this basis:

(1) *Less than 6 months* from date of most recent initial issue: He gets no allowance.

(2) *More than 6 months* from date of most recent initial issue but less than 3 years: He gets the basic allowance.

(3) *More than 3 years* from date of most recent initial issue: He gets the standard allowance. He continues to get it until he goes off active duty or until he is transferred to a command that does not use the clothing allowance system.

c. *Break in service.*

A break in service does not affect the allowance schedule, since the schedule is based on the date of the most recent issue of clothing.

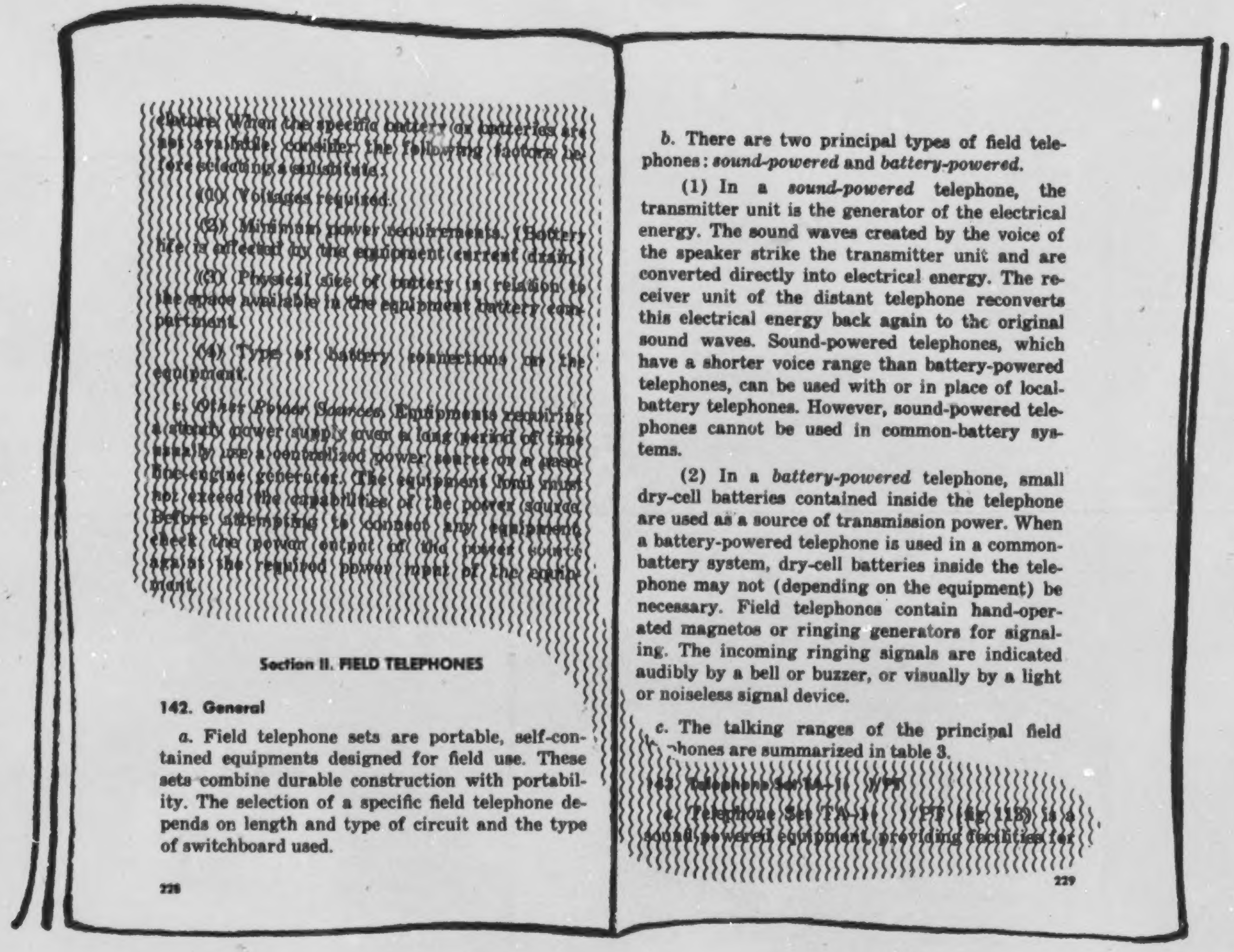
(1) If a soldier gets a new initial issue of clothing when he reenlists, that issue becomes the "most recent issue." The date of that issue marks the beginning of the first 6 month period.

(2) If a soldier does not get a new initial issue of clothing when he reenlists, his "most recent issue" is the last one he drew before his discharge. The date of that issue marks the starting point in determining which allowance he will get.

AFTER

Type of Literature: SIGNAL - TECHNICAL
Rewrite Problem(s):
HARD WORDS
TOO VAGUE
CONFUSING
No. of 1 Syll. words/Total No. words: 118/219=54%
FORCAST Reading Grade Level Score: 11.7

B E F O R E



cedure. When the specific battery or batteries are not available, consider the following factors before selecting a substitute:

(1) Voltages required.

(2) Minimum power requirements. (Battery life is affected by the equipment current drain.)

(3) Physical size of battery in relation to the space available in the equipment battery compartment.

(4) Type of battery connections on the equipment.

c. Other Power Sources. Equipments requiring a steady power supply over a long period of time usually use a centralized power source or a gasoline-engine generator. The equipment load must not exceed the capabilities of the power source. Before attempting to connect any equipment, check the power output of the power source against the required power input of the equipment.

Section II. FIELD TELEPHONES

142. General

a. Field telephone sets are portable, self-contained equipments designed for field use. These sets combine durable construction with portability. The selection of a specific field telephone depends on length and type of circuit and the type of switchboard used.

228

b. There are two principal types of field telephones: *sound-powered* and *battery-powered.*

(1) In a *sound-powered* telephone, the transmitter unit is the generator of the electrical energy. The sound waves created by the voice of the speaker strike the transmitter unit and are converted directly into electrical energy. The receiver unit of the distant telephone reconverts this electrical energy back again to the original sound waves. Sound-powered telephones, which have a shorter voice range than battery-powered telephones, can be used with or in place of local-battery telephones. However, sound-powered telephones cannot be used in common-battery systems.

(2) In a *battery-powered* telephone, small dry-cell batteries contained inside the telephone are used as a source of transmission power. When a battery-powered telephone is used in a common-battery system, dry-cell batteries inside the telephone may not (depending on the equipment) be necessary. Field telephones contain hand-operated magnetos or ringing generators for signaling. The incoming ringing signals are indicated audibly by a bell or buzzer, or visually by a light or noiseless signal device.

c. The talking ranges of the principal field telephones are summarized in table 3.

143. Telephone Set TA-1( )/PT

a. Telephone Set TA-1( )/PT (fig. 113) is a sound-powered equipment, providing facilities for

229

Type of Literature: **SIGNAL - TECHNICAL**

Primary User: **WORKER**
Information Objectives: **WHAT IT IS - HOW IT'S USED**

No. of 1 Syll. words/Total No. words: **157/230=68%**
FORCAST Reading Grade Level Score: **9.8**

SECTION II: FIELD TELEPHONES:

142. Types of Field Telephones

Field telephone sets are specially made for use in the field. They can be easily moved from place to place and are built to stand up under the rough conditions of field use.

There are two main types of field telephones: sound-powered and battery-powered.

(1) Sound-powered telephones do not use batteries. These telephones have a transmitter which changes the sound waves of your voice into electrical energy. The receiver in the distant telephone turns the electrical energy back into sound waves so that the person at that end hears your voice.

Sound-powered telephones cannot transmit your voice as far as battery-powered telephones can. Sound-powered telephones can be used when there is less than 6 to 10 miles of field wire between telephones.

(2) Battery-powered telephones use the electrical energy from batteries to transmit your voice to other telephones. The batteries may be inside the telephone or they may be at a central office which supplies the power for all of the telephones on the circuit. When the batteries are inside each telephone the circuit is called a local-battery system. A circuit that uses batteries at a central office is called a common-battery system.

Battery-powered telephones can be used when there is up to 40 miles or so of field wire between telephones. The local-battery type can be used with sound-powered telephones but the common-battery type cannot.

AFTER

Type of Literature: SIGNAL - TECHNICAL
Rewrite Problem(s):
HARD WORDS

No. of 1 Syll. words/Total No. words: 159/289=55%
FORCAST Reading Grade Level Score: 11.7

B
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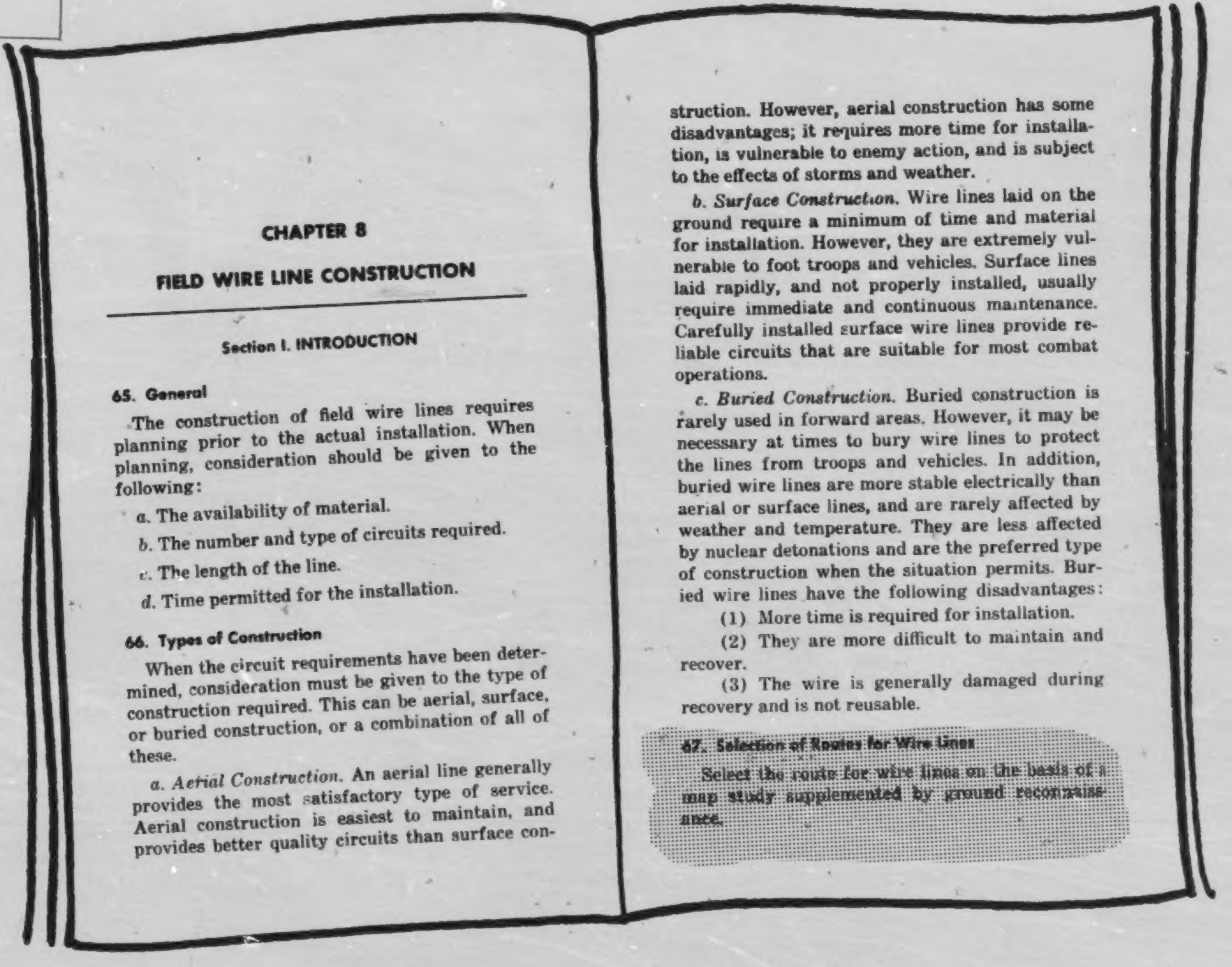


CHAPTER 8

FIELD WIRE LINE CONSTRUCTION

Section I. INTRODUCTION

65. General

The construction of field wire lines requires planning prior to the actual installation. When planning, consideration should be given to the following:

a. The availability of material.

b. The number and type of circuits required.

c. The length of the line.

d. Time permitted for the installation.

66. Types of Construction

When the circuit requirements have been determined, consideration must be given to the type of construction required. This can be aerial, surface, or buried construction, or a combination of all of these.

a. Aerial Construction. An aerial line generally provides the most satisfactory type of service. Aerial construction is easiest to maintain, and provides better quality circuits than surface construction. However, aerial construction has some disadvantages; it requires more time for installation, is vulnerable to enemy action, and is subject to the effects of storms and weather.

b. Surface Construction. Wire lines laid on the ground require a minimum of time and material for installation. However, they are extremely vulnerable to foot troops and vehicles. Surface lines laid rapidly, and not properly installed, usually require immediate and continuous maintenance. Carefully installed surface wire lines provide reliable circuits that are suitable for most combat operations.

c. Buried Construction. Buried construction is rarely used in forward areas. However, it may be necessary at times to bury wire lines to protect the lines from troops and vehicles. In addition, buried wire lines are more stable electrically than aerial or surface lines, and are rarely affected by weather and temperature. They are less affected by nuclear detonations and are the preferred type of construction when the situation permits. Buried wire lines have the following disadvantages:

(1) More time is required for installation.

(2) They are more difficult to maintain and recover.

(3) The wire is generally damaged during recovery and is not reusable.

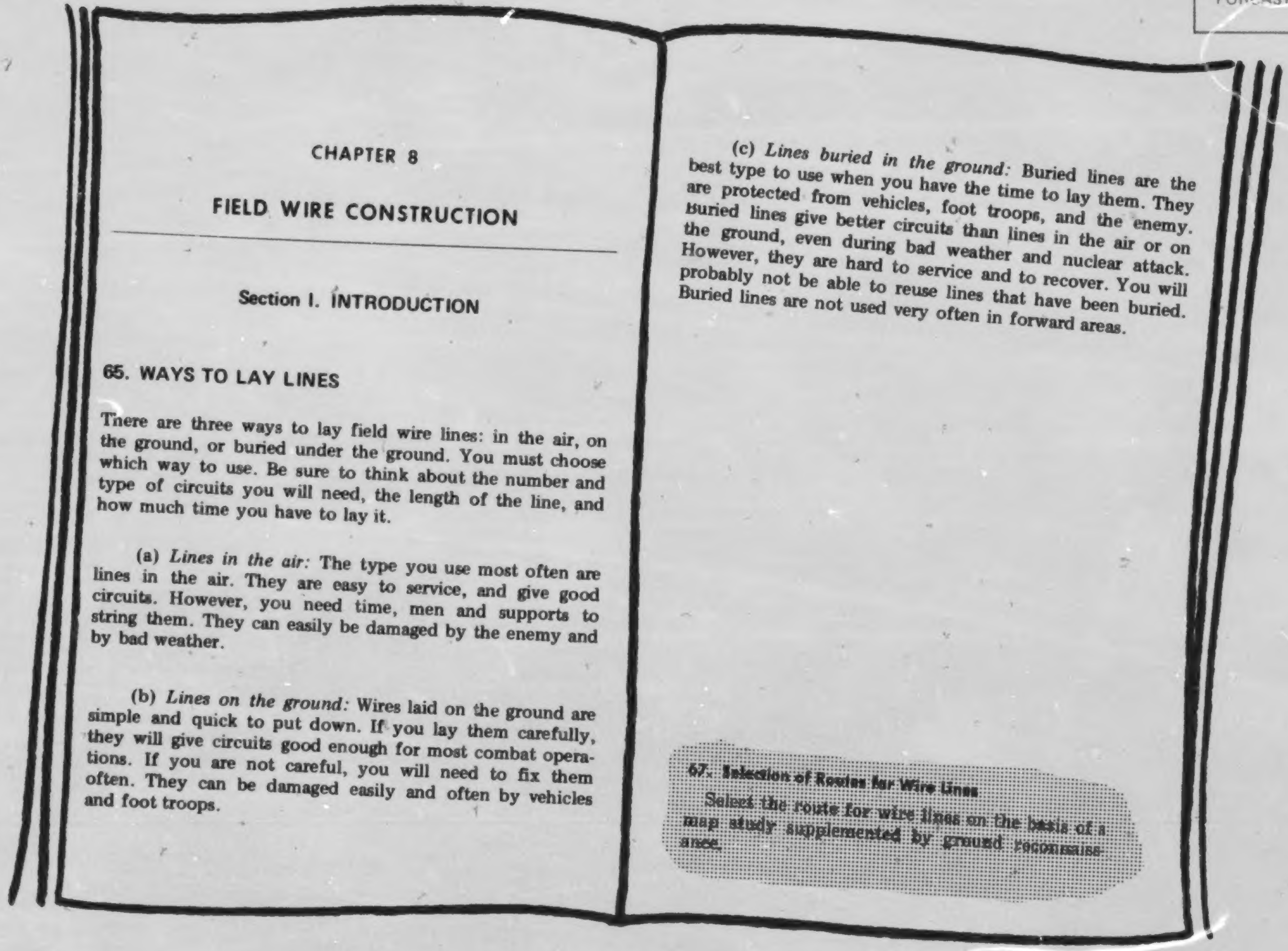
67. Selection of Routes for Wire Lines

Select the route for wire lines on the basis of a map study supplemented by ground reconnaissance.

Type of Literature: **SIGNAL · TECHNICAL**

Primary User: **WORKER**
Information Objectives: **HOW IT'S USED · WHEN TO USE IT**

No. of 1 Syll. words/Total No. words: **192/244=79%**
FORCAST Reading Grade Level Score: **8.2**



CHAPTER 8

FIELD WIRE CONSTRUCTION

Section I. INTRODUCTION

65. WAYS TO LAY LINES

There are three ways to lay field wire lines: in the air, on the ground, or buried under the ground. You must choose which way to use. Be sure to think about the number and type of circuits you will need, the length of the line, and how much time you have to lay it.

(a) *Lines in the air:* The type you use most often are lines in the air. They are easy to service, and give good circuits. However, you need time, men and supports to string them. They can easily be damaged by the enemy and by bad weather.

(b) *Lines on the ground:* Wires laid on the ground are simple and quick to put down. If you lay them carefully, they will give circuits good enough for most combat operations. If you are not careful, you will need to fix them often. They can be damaged easily and often by vehicles and foot troops.

(c) *Lines buried in the ground:* Buried lines are the best type to use when you have the time to lay them. They are protected from vehicles, foot troops, and the enemy. Buried lines give better circuits than lines in the air or on the ground, even during bad weather and nuclear attack. However, they are hard to service and to recover. You will probably not be able to reuse lines that have been buried. Buried lines are not used very often in forward areas.

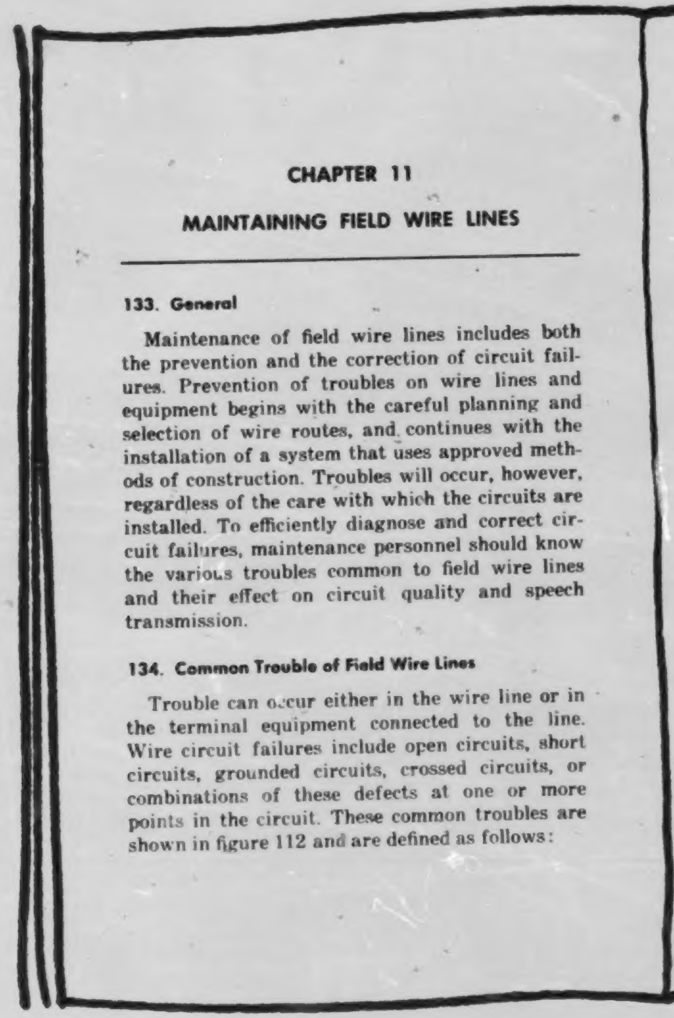
67. Selection of Routes for Wire Lines

Select the route for wire lines on the basis of a map study supplemented by ground reconnaissance.

AFTER

Type of Literature: SIGNAL - TECHNICAL
Rewrite Problem(s):
HARD WORDS
TOO WORDY
RUN-TOGETHER FORMAT
No. of 1 Syll. words/Total No. words: 192/316=61%
FORCAST Reading Grade Level Score: 10.8

BEFORE



CHAPTER 11

MAINTAINING FIELD WIRE LINES

133. General

Maintenance of field wire lines includes both the prevention and the correction of circuit failures. Prevention of troubles on wire lines and equipment begins with the careful planning and selection of wire routes, and continues with the installation of a system that uses approved methods of construction. Troubles will occur, however, regardless of the care with which the circuits are installed. To efficiently diagnose and correct circuit failures, maintenance personnel should know the various troubles common to field wire lines and their effect on circuit quality and speech transmission.

134. Common Trouble of Field Wire Lines

Trouble can occur either in the wire line or in the terminal equipment connected to the line. Wire circuit failures include open circuits, short circuits, grounded circuits, crossed circuits, or combinations of these defects at one or more points in the circuit. These common troubles are shown in figure 112 and are defined as follows:

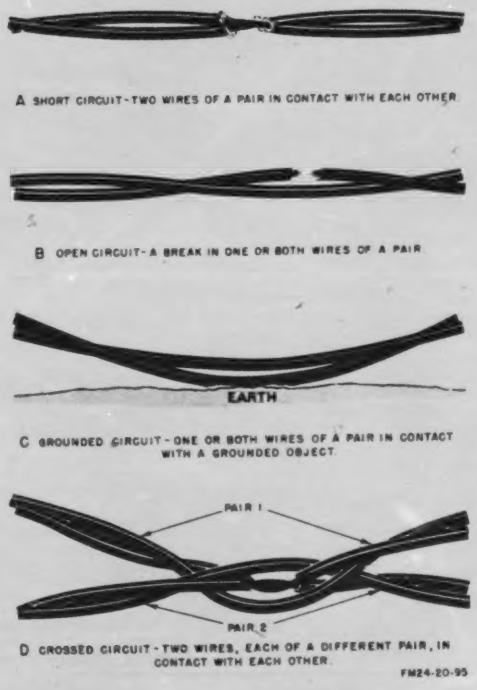
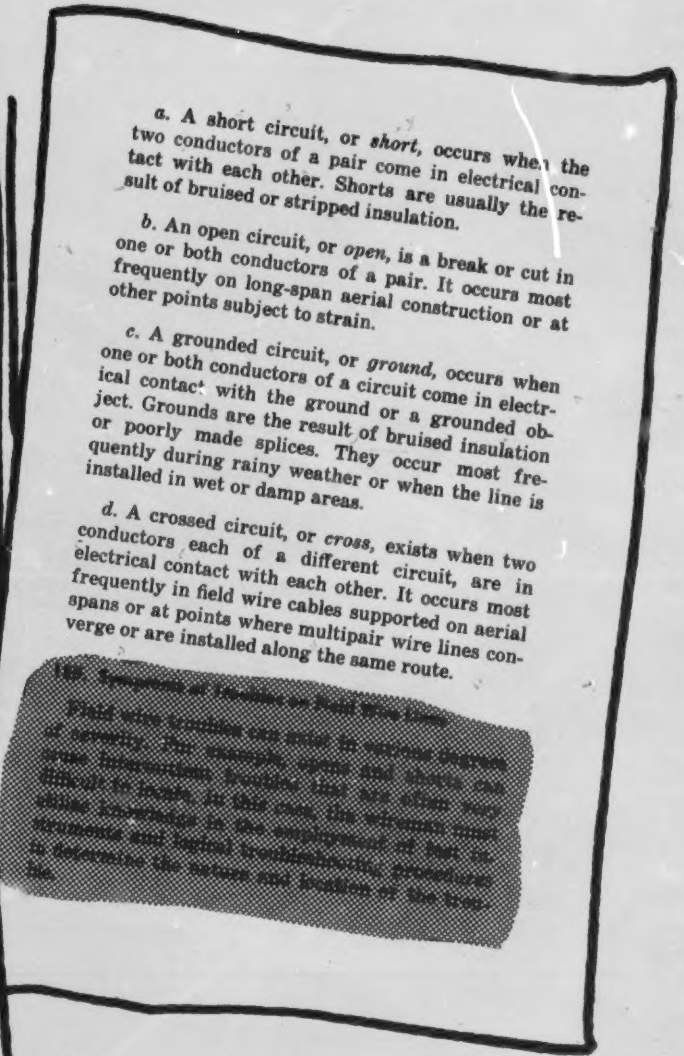

A SHORT CIRCUIT - TWO WIRES OF A PAIR IN CONTACT WITH EACH OTHER
B OPEN CIRCUIT - A BREAK IN ONE OR BOTH WIRES OF A PAIR
EARTH
C GROUNDED CIRCUIT - ONE OR BOTH WIRES OF A PAIR IN CONTACT WITH A GROUNDED OBJECT
PAIR 1
PAIR 2
D CROSSED CIRCUIT - TWO WIRES, EACH OF A DIFFERENT PAIR, IN CONTACT WITH EACH OTHER
FM24-20-95

Figure 112. Common troubles in field wire lines.



a. A short circuit, or *short*, occurs when the two conductors of a pair come in electrical contact with each other. Shorts are usually the result of bruised or stripped insulation.

b. An open circuit, or *open*, is a break or cut in one or both conductors of a pair. It occurs most frequently on long-span aerial construction or at other points subject to strain.

c. A grounded circuit, or *ground*, occurs when one or both conductors of a circuit come in electrical contact with the ground or a grounded object. Grounds are the result of bruised insulation or poorly made splices. They occur most frequently during rainy weather or when the line is installed in wet or damp areas.

d. A crossed circuit, or *cross*, exists when two conductors each of a different circuit, are in electrical contact with each other. It occurs most frequently in field wire cables supported on aerial spans or at points where multipair wire lines converge or are installed along the same route.

[redacted]

Type of Literature: SIGNAL - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT IT IS - HOW IT DOES IT

No. of 1 Syll. words/Total No. words: 161/197=82%
FORCAST Reading Grade Level Score: 7.7

CHAPTER 11

MAINTAINING FIELD WIRE LINES

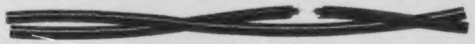
133. Common Trouble of Field Wire Lines

Field wire lines should be laid down well, according to a good route plan. Yet even such lines may have a circuit failure. To be able to find and fix telephone circuit failures quickly, you should know the troubles that are the most common to field wire lines.

A. *Short*, or short circuit.

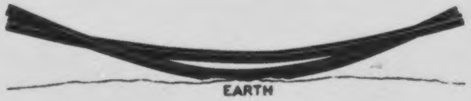
What it is: Two bare wires of a pair touch each other.
Main cause: Worn insulation on the wire.

B. *Open*, or open circuit.



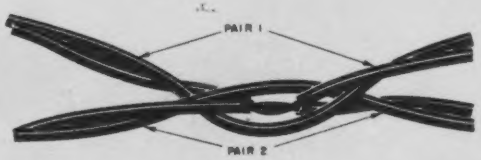
What it is: A break or cut in one or both of the bare wires of a pair.
Main cause: Strain on the wire, such as on long-span aerial construction.

C. *Ground*, or grounded circuit.



What it is: One or both of the bare wires of a pair touch the ground or an object that is grounded.
Main cause: Worn insulation or bad splices. A ground usually happens when the line gets wet.

D. *Cross*, or crossed circuit.

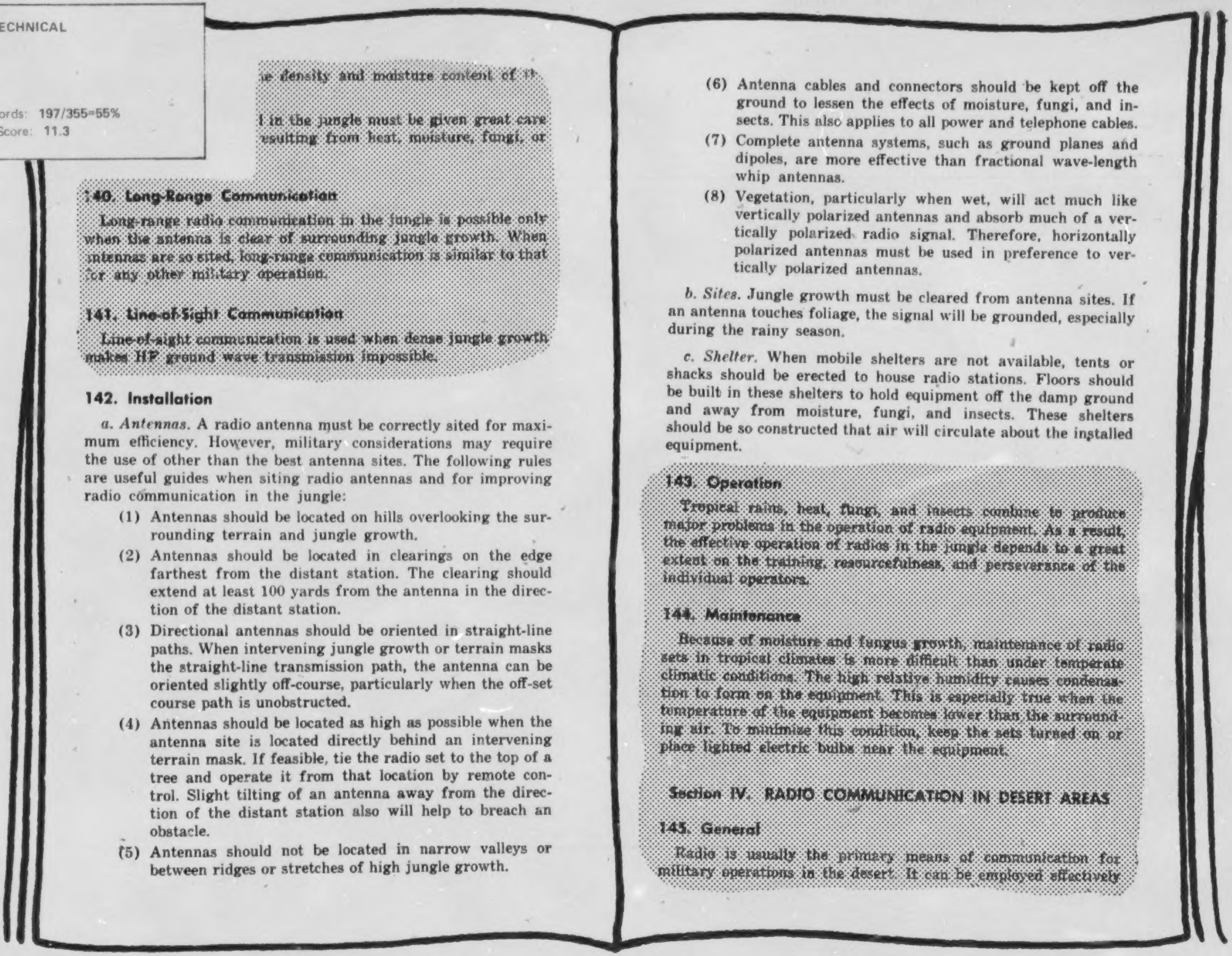


What it is: Two bare wires which are not from the same pair touch each other.
Main cause: Occurs most often on aerial spans or at points where several lines meet or where wire lines are laid on the same route.

AFTER

Type of Literature: **SIGNAL · TECHNICAL**
Rewrite Problem(s):
HARD WORDS
NOT DIRECT
CONFUSING
No. of 1 Syll. words/Total No. words: **197/355=55%**
FORCAST Reading Grade Level Score: **11.3**

BEFORE



e density and moisture content of

l in the jungle must be given great care
esulting from heat, moisture, fungi, or

140. Long-Range Communication

Long-range radio communication in the jungle is possible only when the antenna is clear of surrounding jungle growth. When antennas are so sited, long-range communication is similar to that for any other military operation.

141. Line-of-Sight Communication

Line-of-sight communication is used when dense jungle growth makes HF ground wave transmission impossible.

142. Installation

a. Antennas. A radio antenna must be correctly sited for maximum efficiency. However, military considerations may require the use of other than the best antenna sites. The following rules are useful guides when siting radio antennas and for improving radio communication in the jungle:

(1) Antennas should be located on hills overlooking the surrounding terrain and jungle growth.

(2) Antennas should be located in clearings on the edge farthest from the distant station. The clearing should extend at least 100 yards from the antenna in the direction of the distant station.

(3) Directional antennas should be oriented in straight-line paths. When intervening jungle growth or terrain masks the straight-line transmission path, the antenna can be oriented slightly off-course, particularly when the off-set course path is unobstructed.

(4) Antennas should be located as high as possible when the antenna site is located directly behind an intervening terrain mask. If feasible, tie the radio set to the top of a tree and operate it from that location by remote control. Slight tilting of an antenna away from the direction of the distant station also will help to breach an obstacle.

(5) Antennas should not be located in narrow valleys or between ridges or stretches of high jungle growth.

(6) Antenna cables and connectors should be kept off the ground to lessen the effects of moisture, fungi, and insects. This also applies to all power and telephone cables.

(7) Complete antenna systems, such as ground planes and dipoles, are more effective than fractional wave-length whip antennas.

(8) Vegetation, particularly when wet, will act much like vertically polarized antennas and absorb much of a vertically polarized radio signal. Therefore, horizontally polarized antennas must be used in preference to vertically polarized antennas.

b. Sites. Jungle growth must be cleared from antenna sites. If an antenna touches foliage, the signal will be grounded, especially during the rainy season.

c. Shelter. When mobile shelters are not available, tents or shacks should be erected to house radio stations. Floors should be built in these shelters to hold equipment off the damp ground and away from moisture, fungi, and insects. These shelters should be so constructed that air will circulate about the installed equipment.

143. Operation

Tropical rains, heat, fungi, and insects combine to produce major problems in the operation of radio equipment. As a result, the effective operation of radios in the jungle depends to a great extent on the training, resourcefulness, and perseverance of the individual operators.

144. Maintenance

Because of moisture and fungus growth, maintenance of radio sets in tropical climates is more difficult than under temperate climatic conditions. The high relative humidity causes condensation to form on the equipment. This is especially true when the temperature of the equipment becomes lower than the surrounding air. To minimize this condition, keep the sets turned on or place lighted electric bulbs near the equipment.

Section IV. RADIO COMMUNICATION IN DESERT AREAS

145. General

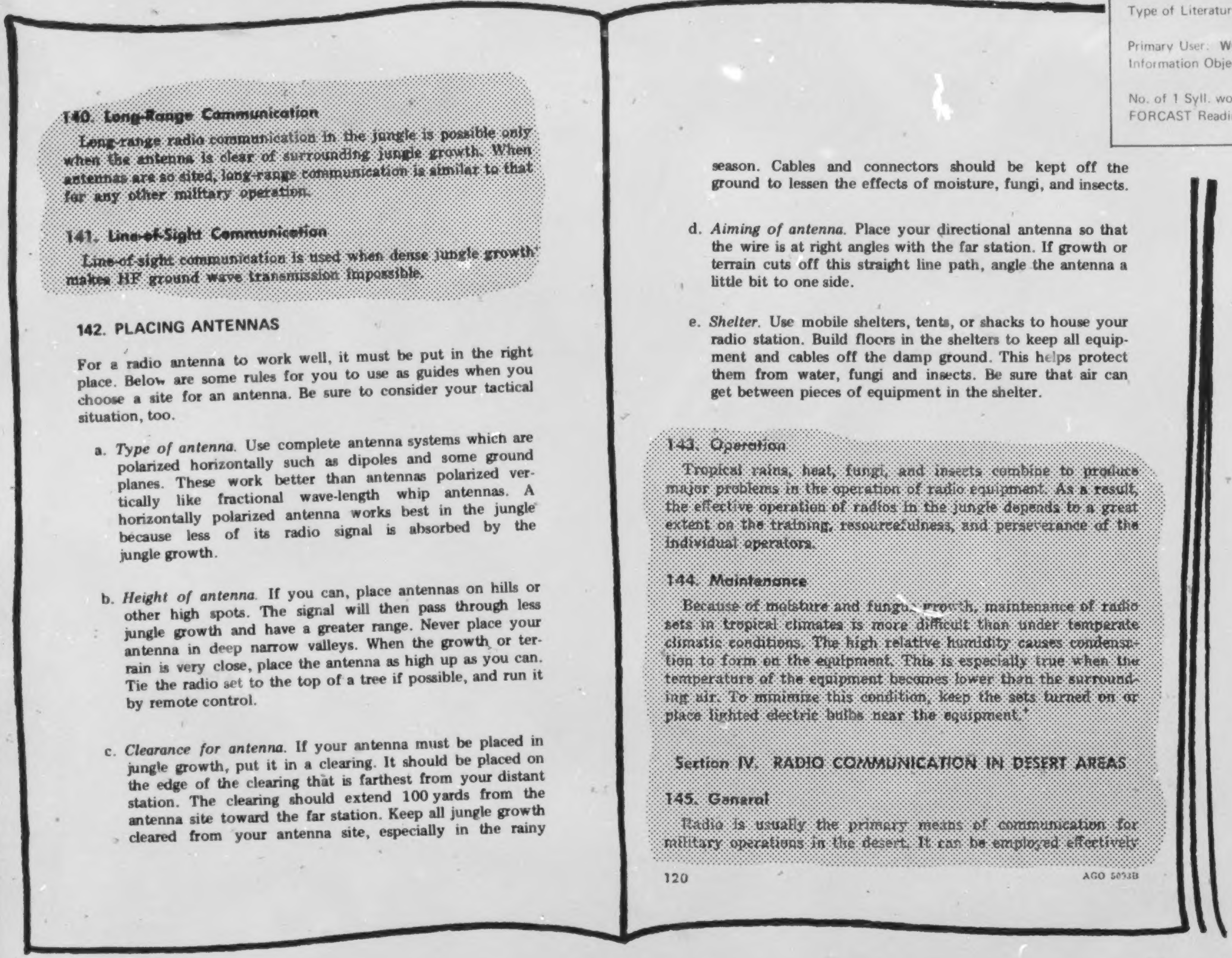
Radio is usually the primary means of communication for military operations in the desert. It can be employed effectively

Type of Literature: **SIGNAL - TECHNICAL**

Primary User: **WORKER**
Information Objectives: **WHAT TO DO**

No. of 1 Syll. words/Total No. words: **230/332=69%**
FORCAST Reading Grade Level Score: **9.6**

AFTER



140. Long-Range Communication

Long-range radio communication in the jungle is possible only when the antenna is clear of surrounding jungle growth. When antennas are so sited, long-range communication is similar to that for any other military operation.

141. Line-of-Sight Communication

Line-of-sight communication is used when dense jungle growth makes HF ground wave transmission impossible.

142. PLACING ANTENNAS

For a radio antenna to work well, it must be put in the right place. Below are some rules for you to use as guides when you choose a site for an antenna. Be sure to consider your tactical situation, too.

a. *Type of antenna.* Use complete antenna systems which are polarized horizontally such as dipoles and some ground planes. These work better than antennas polarized vertically like fractional wave-length whip antennas. A horizontally polarized antenna works best in the jungle because less of its radio signal is absorbed by the jungle growth.

b. *Height of antenna.* If you can, place antennas on hills or other high spots. The signal will then pass through less jungle growth and have a greater range. Never place your antenna in deep narrow valleys. When the growth or terrain is very close, place the antenna as high up as you can. Tie the radio set to the top of a tree if possible, and run it by remote control.

c. *Clearance for antenna.* If your antenna must be placed in jungle growth, put it in a clearing. It should be placed on the edge of the clearing that is farthest from your distant station. The clearing should extend 100 yards from the antenna site toward the far station. Keep all jungle growth cleared from your antenna site, especially in the rainy season. Cables and connectors should be kept off the ground to lessen the effects of moisture, fungi, and insects.

d. *Aiming of antenna.* Place your directional antenna so that the wire is at right angles with the far station. If growth or terrain cuts off this straight line path, angle the antenna a little bit to one side.

e. *Shelter.* Use mobile shelters, tents, or shacks to house your radio station. Build floors in the shelters to keep all equipment and cables off the damp ground. This helps protect them from water, fungi and insects. Be sure that air can get between pieces of equipment in the shelter.

143. Operation

Tropical rains, heat, fungi, and insects combine to produce major problems in the operation of radio equipment. As a result, the effective operation of radios in the jungle depends to a great extent on the training, resourcefulness, and perseverance of the individual operators.

144. Maintenance

Because of moisture and fungus growth, maintenance of radio sets in tropical climates is more difficult than under temperate climatic conditions. The high relative humidity causes condensation to form on the equipment. This is especially true when the temperature of the equipment becomes lower than the surrounding air. To minimize this condition, keep the sets turned on or place lighted electric bulbs near the equipment.⁺

Section IV. RADIO COMMUNICATION IN DESERT AREAS

145. General

Radio is usually the primary means of communication for military operations in the desert. It can be employed effectively

120 AGO 5033B

Type of Literature: TRANSPORTATION - TECHNICAL
Rewrite Problem(s):
TOO WORDY — RUN-TOGETHER FORMAT
REMOTE REFERENCES
WEAK VISUAL AIDS
No. of 1 Syll. words/Total No. words: 210/364=58%
FORCAST Reading Grade Level Score: 11.3

BEFORE

h. *Starting the Multifuel Engine.* After determining that the engine is free of hydrostatic lock, the operator may start the engine following the procedure outlined below:

(1) Insure that the transmission is neutral and the hand brake is applied.

(2) Push the engine stop lever all the way in.

(3) Turn the accessory switch to the "on" position.

(4) Depress the clutch while operating the starter.

(5) Depress the starter button with a hard firm push. (By not firmly closing the starter switch, damage to the starting motor and switch may result.) The starter button should be released as soon as the engine fires. Under no circumstances should the starter switch be depressed for longer than 30 seconds at one time; usually 10 seconds are sufficient. If the engine does not start, wait at least two minutes and try again. If the multifuel engine does not start in three trys the condition should be reported to your supervisor. (Multifuel engines should not be started by towing or pushing.)

(6) After the engine has started it should be allowed to idle for 3 to 5 minutes, or until engine heat reaches 120 degrees. Engine speed should be above 800 RPM but under 1000 RPM. Too slow an idle creates vibrations that will loosen some parts and may break others. The warmup benefits the entire engine, but it is especially important for the turbosupercharger. Exhaust gas turns the turbosupercharger at approximately 30,000 RPM at idle speed and up to 60,000 RPM at operating speed. Idling at a low speed allows time for the oil to circulate. (Figure 3–6).

(7) The oil pressure gage should be kept under close observation during the first 20 seconds of idling. If it does not reach 15 PSI at 800 to 1000 RPM, the engine should be stopped immediately and the condition reported to the supervisor.

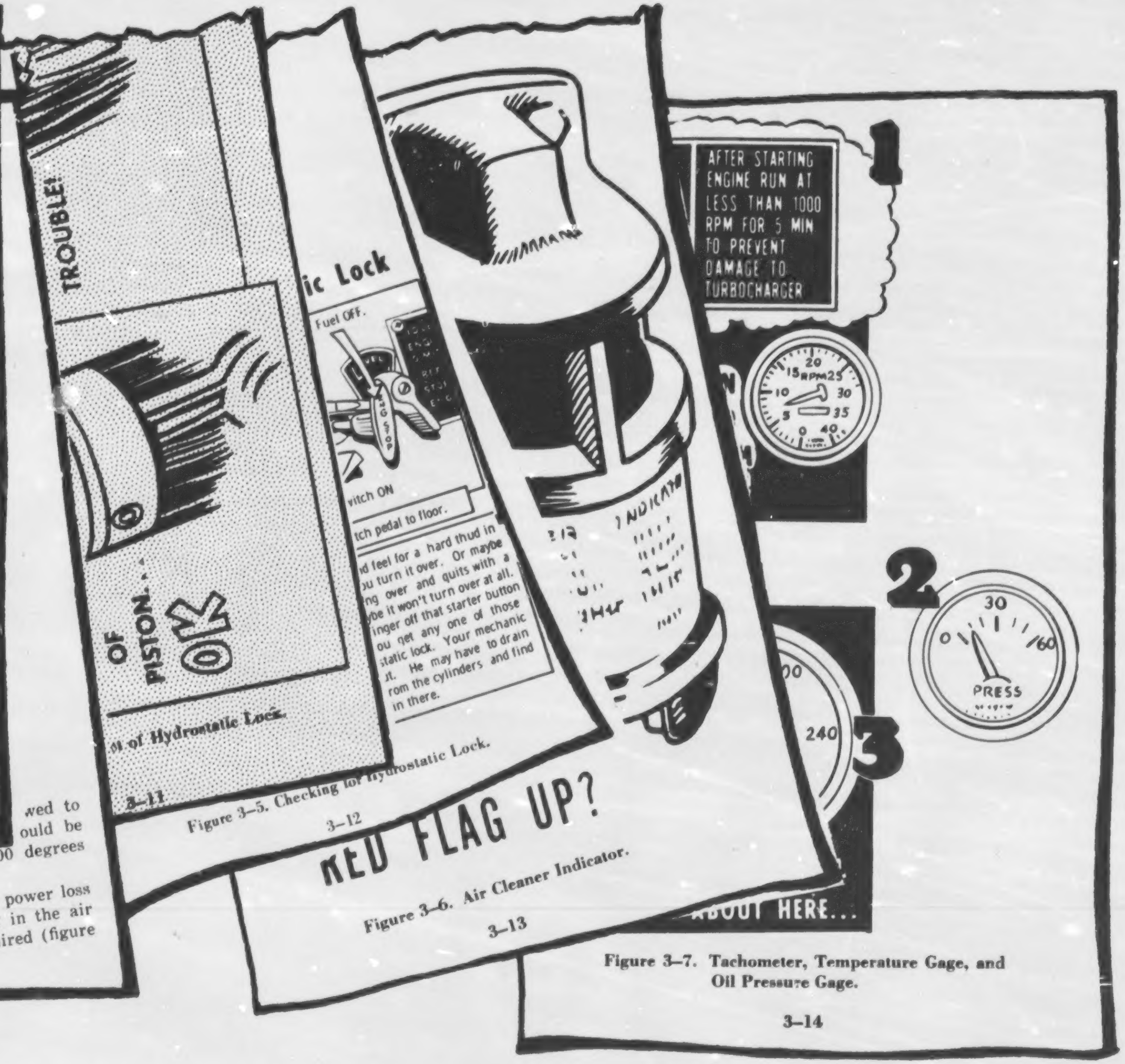
3–9

wed to
ould be

(8) Engine … before the vehicle … 170 to 200 degrees
reach 120 degrees before the vehicle … driven at moderate speed until it reaches 170 to 200 degrees (figure 3–6).

(9) Heavy black smoke, engine missing, and power loss may indicate a dirty air cleaner. When the red flag in the air cleaner indicator is up over halfway, cleaning is required (figure 3–7).

3–10


TROUBLE!
OF PISTON. . .
OK
ic Lock
Fuel OFF.
ENG STOP
vitch ON
tch pedal to floor.
INDICATOR
AFTER STARTING ENGINE RUN AT LESS THAN 1000 RPM FOR 5 MIN TO PREVENT DAMAGE TO TURBOCHARGER
1
15 20 25 RPM 10 30 5 35 0 40
2
30 0 60 PRESS
3
240
ABOUT HERE...

nd feel for a hard thud in
ou turn it over. Or maybe
ng over and quits with a
ybe it won't turn over at all.
inger off that starter button
ou get any one of those
static lock. Your mechanic
it. He may have to drain
rom the cylinders and find
in there.

…of Hydrostatic Lock.

3–11

Figure 3–5. Checking for Hydrostatic Lock.

3–12

RED FLAG UP?

Figure 3–6. Air Cleaner Indicator.

3–13

Figure 3–7. Tachometer, Temperature Gage, and Oil Pressure Gage.

3–14

Type of Literature: **TRANSPORTATION - TECHNICAL**

Primary User: **WORKER**
Information Objectives: **HOW TO DO IT**

No. of 1 Syll. words/Total No. words: 249/366=68%
FORCAST Reading Grade Level Score: 9.8

Starting the Multifuel Engine

(1) CHECK FOR HYDROSTATIC LOCK.

1. Put gearshift in neutral and the handbrake on.

2. Check to make sure that the engine stop handle (fuel cutoff) is pulled all the way out. (Fuel off.)

3. Turn the accessory switch to the "on" position.

4. Push the clutch pedal to floor.

5. Press down starter button with a hard, firm push for 2 or 3 seconds.

6. Listen for a thud or thunk.

Signs of hydrostatic lock are:
Engine turns over with a hard thud.
Engine turns over and then quits with a thunk.
Engine won't turn over.

7. If you find any sign of hydrostatic lock, have your mechanic check it out.

(2) START THE ENGINE.

1. Push the engine stop handle all the way in. (Fuel on.)

Be sure that:
1. The transmission is neutral.
2. The handbrake is on.
3. The accessory switch is at the "on" position.
4. The clutch is pushed to the floor.

2. Press down the starter button with a hard, firm push.

Never press the starter switch for more than 30 seconds at one time. Usually 10 seconds are enough.

3. Release the starter button as soon as the engine fires.

If the engine does not start, wait at least two minutes and try again.
If the engine does not start in three tries, report that fact to your supervisor.
Never try to start a multifuel engine by towing or pushing.

4. Keep the engine speed above 800 RPM but under 1000 RPM.

The idle must be slow enough to allow time for the oil to circulate but not so slow that it causes vibrations that will loosen some parts and may break others.

5. Watch the oil pressure gage closely during the first 20 seconds of idling.

Oil pressure gage should reach 15 PSI.

If it does not reach 15 PSI at 800 to 1000 RPM, stop the engine immediately and report that fact to the supervisor.

6. Let the engine idle until engine heat reaches 120 degrees.

7. Drive at moderate speed until it reaches 170 to 200 degrees.

Heavy black smoke, engine missing, and power loss may indicate a dirty air cleaner. When the red flag in the air cleaner indicator is up over halfway, the air cleaner needs to be cleaned.

AFTER

BEFORE

Type of Literature: TRANSPORTATION · TECHNICAL
Rewrite Problem(s):
HARD WORDS TOO WORDY
LONG SENTENCES CONFUSING
NOT DIRECT
No. of 1 Syll. words/Total No. words: 458/714=64%
FORCAST Reading Grade Level Score: 10.4

CHAPTER 3
IN-FLIGHT STABILITY OF SLING LOADS

3-1. Theory of Stabilizing Sling Loads

a. The aerodynamic phenomena of side to side movement and forward-aft oscillation of cargo suspended beneath a helicopter show that the pilot is flying two different bodies: One is the helicopter, which is aerodynamically stable; the other is the sling load, which seldom is aerodynamically stable. Therefore, most of the problems encountered in helicopter external lifts concern the instability of loads in flight.

b. Load instability will occur whenever the weight of a suspended load is not sufficient to hold it down against the drag of the air through which it moves. It is commonly experienced with elongated loads that are symmetrical about their CG's. Such loads will always turn broadside to the direction of flight, thus exposing maximum drag surface. The lighter the load in proportion to the exposed drag surface, the lower is the airspeed at which instability will occur. Stabilization of such loads may be assured by one or more of the following means:

(1) Reducing the airspeed of the helicopter.

(2) Increasing the weight of the load.

(3) Reducing the drag surface by altering the relationship between the CG and the center of pressure of the suspended load in such a way as to assure that the narrowest surface points in the direction of flight.

c. Normally, the drag-surface-reduction means is the preferred solution. This effect is achieved either by adding surface to the rear of the load or by adding weight to the front. The general rule is that stability will be assured at practical helicopter speeds when the load's CG is located at the front third of the surface area.

d. While it is true that a load may be stabilized by reducing the airspeed, this means should be used only as a last resort. Any airspeed below approximately 60 knots will severely degrade the pilot's opportunity to jettison the load and perform an autorotational landing in the event of power failure. For this reason, the rigging procedures for all tactical loads should be based on the requirement to fly the loads at speeds in excess of 60 knots. When this rigging criterion cannot be met, appropriate cautionary steps should be taken during flight of the load. For example, a small CONEX container may be flown at 60 knots when its total weight exceeds 2,500 pounds. When the container is flown empty, however, severe instability will occur at about 30 to 40 knots of airspeed.

3-2. Examples of Load Stabilization

a. There are two expedient means of stabilizing sling loads. One is by adding surface to the rear of the load. In this concept, the added surface consists of related equipment of light density such as connecting a trailer to the vehicle to be lifted. Since the amount of additional surface is out of proportion to the weight that has been added, the relationship between the CG and center of pressure of the total load has been altered and the load tends to stabilize in flight. The addition of related equipment is a more practical technique than that of installing rigid fins or similar airfoil spoilers onto the rear of the load.

b. Another means of stabilizing a sling load is by adding weight to the front of the load. In this concept, supplies of high density are secured to the front end of the load. Since the amount of additional weight is out of proportion to the amount of surface that has been added, the relationship between the CG and center of pressure of the total load has been altered and the load tends to stabilize in flight. While this basic concept is simple, its mathematical application under field conditions is complex because the amount of weight to be added must be calculated in moments rather than raw weight. The desired balance location is a point at which not more than one-third of the total surface will be located forward of the CG. Weight must be added so as to cause the moment of the forward one-third to equal the moment of the rear two-thirds of the load. This value can be mathematically calculated by the same methods used to determine the balance of a loaded aircraft. A suitable system that will usually be more satisfactory under field conditions can be employed by using figure 3-1 as a guide.

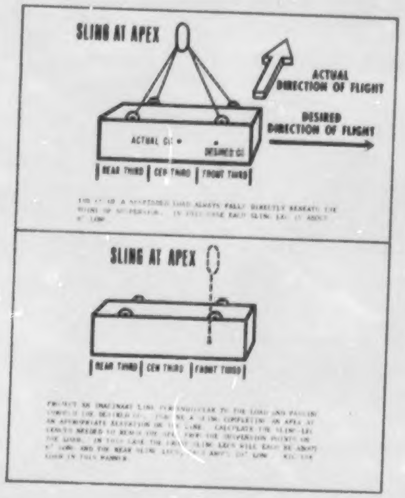


Figure 3-1 ① *Instructions for rigging a typical sling load to assure its in-flight stability.*

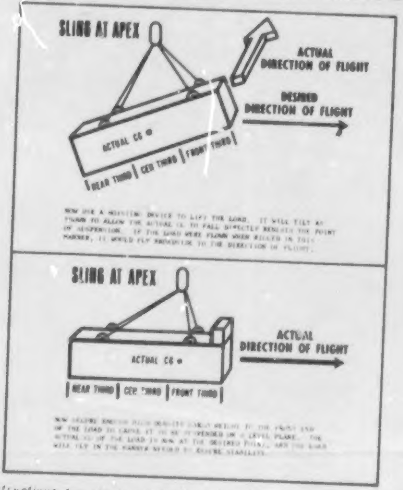


Figure 3-1 ② *Instructions for rigging a typical sling load to assure its in-flight stability.*

In this example, the typical configured load is 12 feet by 3 feet by 1 foot, weighs 600 pounds, is symmetrical about its CG, and will always fly broadside to the direction of flight.

Type of Literature: TRANSPORTATION - TECHNICAL

Primary User: WORKER
Information Objectives: HOW IT DOES IT - WHAT TO DO

No. of 1 Syll. words/Total No. words: 448/559=80%
FORCAST Reading Grade Level Score: 8.0

AFTER

Chapter 3

IN-FLIGHT STABILITY OF SLING LOADS

3-1. STABILIZING SLING LOADS

A load which is carried by sling under a helicopter must be rigged so that it will be stable in flight. If the load is not rigged properly, it will sway forward and aft and from side to side at the same time. This movement happens at speeds of 30 to 40 knots or more and then makes it difficult for the helicopter to fly.

A sling load is unstable whenever it does not weigh enough to hold it down against the force of the air through which it moves. You make such a load stable when you do one or more of the following things:

(a) *Slow the helicopter.*
(b) *Increase the weight of the load.*
(c) *Keep the narrowest part of the load pointing forward.*

Slowing a helicopter down is not a good way to make a load stable. If the helicopter flys much slower than 60 knots, it is hard to land in case the engine stops. There are two convenient methods you use to make a load stable. Each of these increases the weight of the load and keeps the narrow part of the load pointing forward.

One method you can use to make a load more stable is to add surface to the rear of the load. This is done when a trailer is added to a vehicle which is the main load. The trailer adds more surface than weight and acts like the tail of a kite. The whole load tends to travel straight forward and so is stable.

Another method you can use to make a load more stable is to add weight to the front of the load and adjust the slings so that the front slings are shorter than the rear slings. The weight you add can be supplies which are heavy for their size. This change makes the point of balance or center of gravity of the load more forward and will make the load more stable. Use Figure 3-1 as a guide to help you use this method in the field.

The center of gravity or CG of a suspended load always falls directly beneath the point of suspension. The load is improperly rigged in this case with sling legs of the same length. If flown like this, the load would fly broadside to the line of flight.

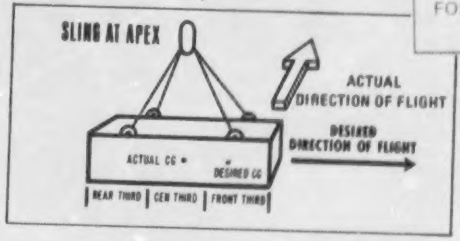


Figure 3-1 ① The Problem:
Rigging a sling load.

a. First decide where in the front third of the load you want the CG to fall. Then extend an imaginary line up at right angles to the load from this point. Locate your sling apex on the line at the desired height above the load. Figure out how long each sling leg needs to be to reach the apex from the suspension points on the load. Rig the load with sling legs of the new length.

b. Now use a hoist to lift the load. It will tilt as shown and the actual CG will fall directly beneath the point of suspension. If the load were flown rigged like this, it would still fly broadside to the direction of flight.

c. Now secure enough small and heavy cargo to the front end to make the load level off. The actual CG of the load is now moved to the new point you chose. The load will be stable in flight because it will stay level and keep its narrowest part pointed forward.

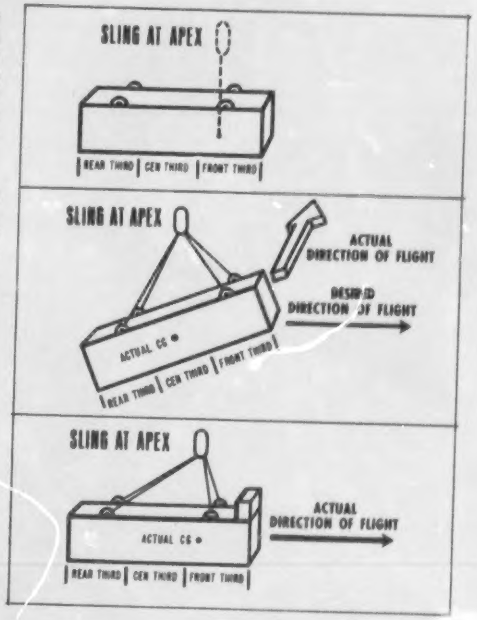


Figure 3-1 ② Solving the Problem:
Rigging a typical sling load to assure its in-flight stability.

Type of Literature: TRANSPORTATION - TECHNICAL
Rewrite Problem(s):
NOT DIRECT REMOTE REFERENCES
TOO WORDY WEAK VISUAL AIDS
CONFUSING
No. of 1 Syll. words/Total No. words: 202/279=72%
FORCAST Reading Grade Level Score: 9.2

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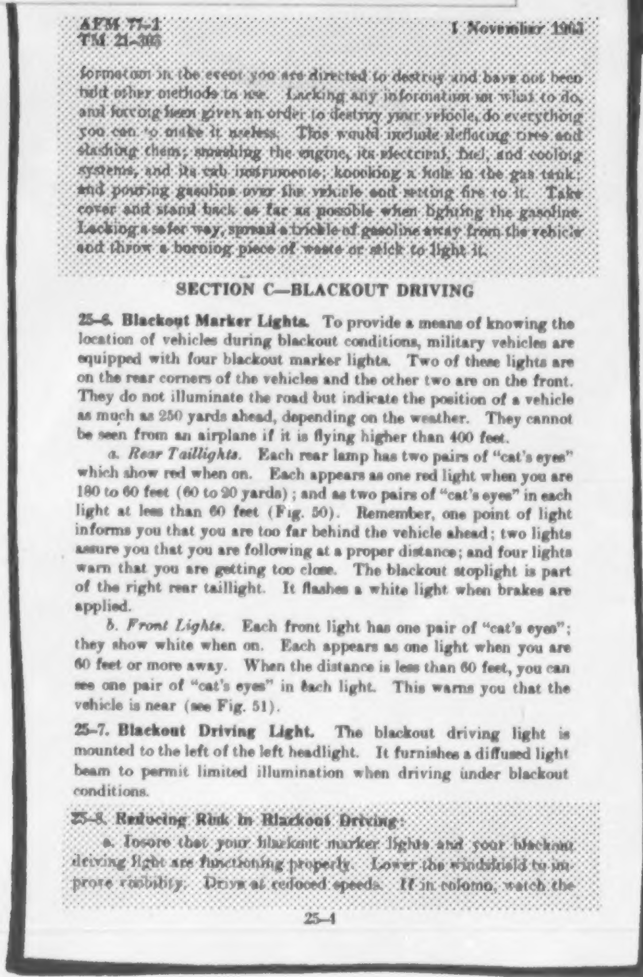


formation in the event you are directed to destroy and have not been told other methods to use. Lacking any information on what to do, and having been given an order to destroy your vehicle, do everything you can to make it useless. This would include deflating tires and slashing them; smashing the engine, its electrical, fuel, and cooling systems, and its cab instruments; knocking a hole in the gas tank; and pouring gasoline over the vehicle and setting fire to it. Take cover and stand back as far as possible when lighting the gasoline. Lacking a safer way, spread a trickle of gasoline away from the vehicle and throw a burning piece of waste or stick to light it.

SECTION C—BLACKOUT DRIVING

25-6. Blackout Marker Lights. To provide a means of knowing the location of vehicles during blackout conditions, military vehicles are equipped with four blackout marker lights. Two of these lights are on the rear corners of the vehicles and the other two are on the front. They do not illuminate the road but indicate the position of a vehicle as much as 250 yards ahead, depending on the weather. They cannot be seen from an airplane if it is flying higher than 400 feet.

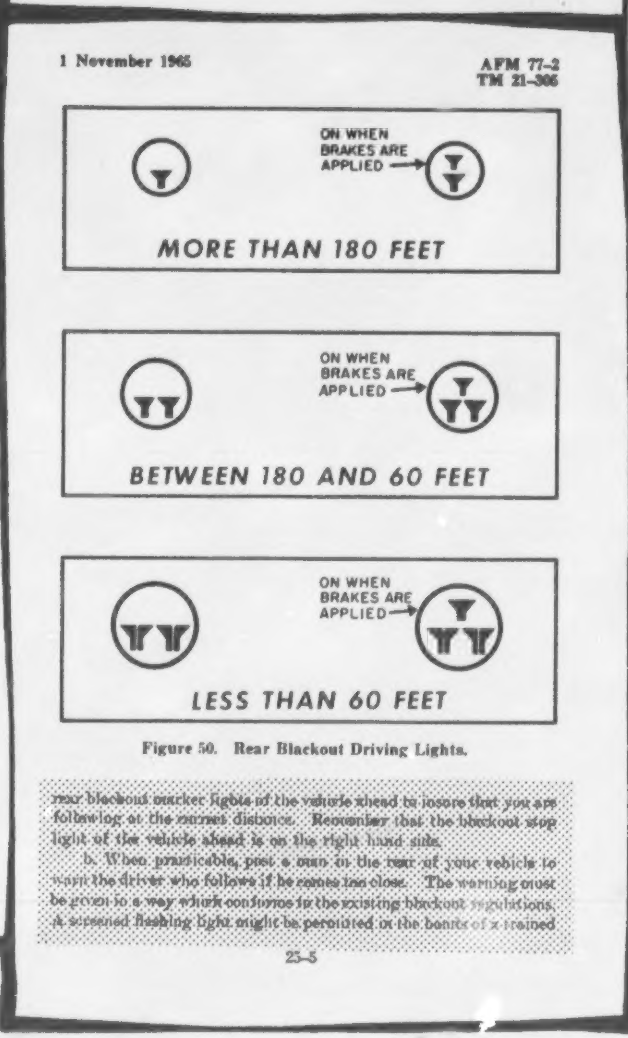
a. Rear Taillights. Each rear lamp has two pairs of "cat's eyes" which show red when on. Each appears as one red light when you are 180 to 60 feet (60 to 20 yards); and as two pairs of "cat's eyes" in each light at less than 60 feet (Fig. 50). Remember, one point of light informs you that you are too far behind the vehicle ahead; two lights assure you that you are following at a proper distance; and four lights warn that you are getting too close. The blackout stoplight is part of the right rear taillight. It flashes a white light when brakes are applied.

b. Front Lights. Each front light has one pair of "cat's eyes"; they show white when on. Each appears as one light when you are 60 feet or more away. When the distance is less than 60 feet, you can see one pair of "cat's eyes" in each light. This warns you that the vehicle is near (see Fig. 51).

25-7. Blackout Driving Light. The blackout driving light is mounted to the left of the left headlight. It furnishes a diffused light beam to permit limited illumination when driving under blackout conditions.

25-8. Reducing Risk in Blackout Driving:

a. Insure that your blackout marker lights and your blackout driving light are functioning properly. Lower the windshield to improve visibility. Drive at reduced speeds. If in column, watch the

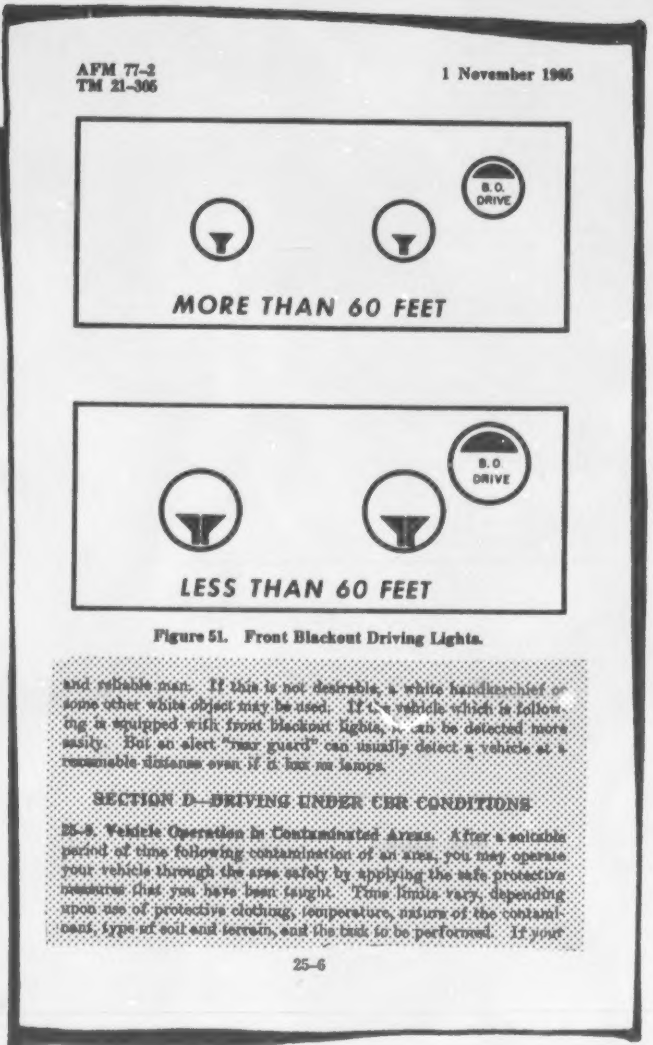


ON WHEN BRAKES ARE APPLIED
MORE THAN 180 FEET
ON WHEN BRAKES ARE APPLIED
BETWEEN 180 AND 60 FEET
ON WHEN BRAKES ARE APPLIED
LESS THAN 60 FEET

Figure 50. Rear Blackout Driving Lights.

rear blackout marker lights of the vehicle ahead to insure that you are following at the correct distance. Remember that the blackout stop light of the vehicle ahead is on the right hand side.

b. When practicable, post a man in the rear of your vehicle to warn the driver who follows if he comes too close. The warning must be given in a way which conforms to the existing blackout regulations. A screened flashing light might be permitted in the hands of a trained



B.O. DRIVE
MORE THAN 60 FEET
B.O. DRIVE
LESS THAN 60 FEET

Figure 51. Front Blackout Driving Lights.

and reliable man. If this is not desirable, a white handkerchief or some other white object may be used. If the vehicle which is following is equipped with front blackout lights, it can be detected more easily. But an alert "rear guard" can usually detect a vehicle at a reasonable distance even if it has no lamps.

SECTION D—DRIVING UNDER CBR CONDITIONS

25-9. Vehicle Operation in Contaminated Areas. After a suitable period of time following contamination of an area, you may operate your vehicle through the area safely by applying the safe protective measures that you have been taught. Time limits vary, depending upon use of protective clothing, temperature, nature of the contaminant, type of soil and terrain, and the task to be performed. If your

Type of Literature: TRANSPORTATION - TECHNICAL

Primary User: WORKER
Information Objectives: WHAT IT IS - WHAT TO DO

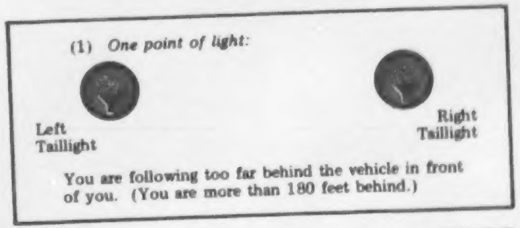
No. of 1 Syll. words/Total No. words: 175/223=78%
FORCAST Reading Grade Level Score: 8.4

BLACKOUT DRIVING

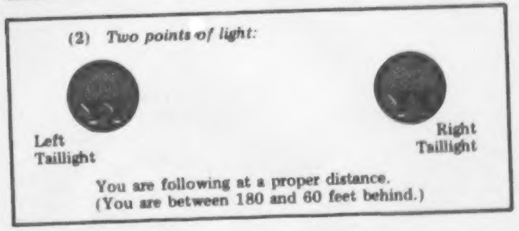
25-6. BLACKOUT MARKER LIGHTS. When you drive in a blackout, you need to know where other vehicles are. Blackout marker lights let you do so. Each military vehicle has two marker lights on the front and two on the back. You can see them as much as 250 yards away in clear weather. They do not light the road and cannot be seen from an airplane if it is flying higher than 400 feet.

25-7. LIGHTS ON VEHICLES YOU ARE FOLLOWING.

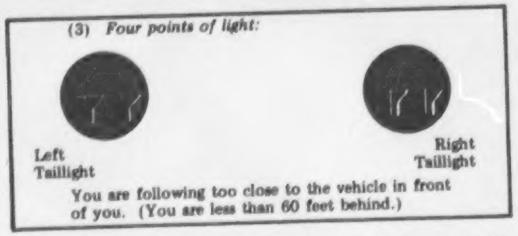
a. *Rear Marker Lights.* The rear marker lights show red when they are on. You can tell how close you are to a vehicle by the number of points of light you can see in each lamp.


(1) *One point of light:*

You are following too far behind the vehicle in front of you. (You are more than 180 feet behind.)

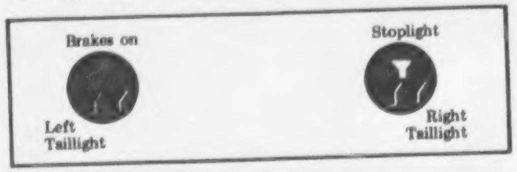

(2) *Two points of light:*

You are following at a proper distance. (You are between 180 and 60 feet behind.)


(3) *Four points of light:*

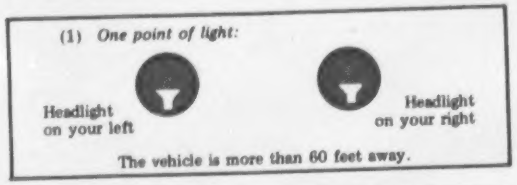
You are following too close to the vehicle in front of you. (You are less than 60 feet behind.)

b. *Blackout stoplight.* The blackout stoplight is part of the right rear taillight. It shows white when the brakes are on.

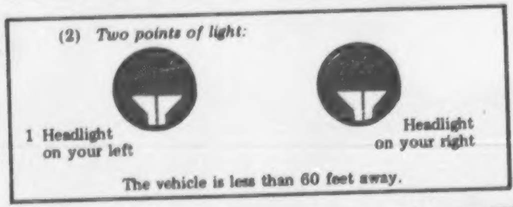


25-8. LIGHTS ON VEHICLES COMING TOWARD YOU.

a. *Front Marker Lights.* The front marker lights show white when they are on. You can tell how far away a vehicle is by the number of points of light you can see in each lamp.

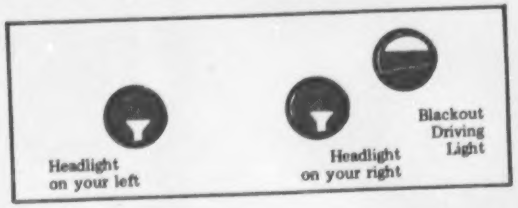

(1) *One point of light:*

The vehicle is more than 60 feet away.


(2) *Two points of light:*

The vehicle is less than 60 feet away.

b. *Blackout Driving Light.* The blackout driving light is mounted to the left of the left headlight. This means that you see it on the right when a vehicle is coming toward you. It gives a diffused beam of white light to help the driver see the road.



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CHAPTER 6

USING ILLUSTRATIONS

WHY SHOULD YOU USE ILLUSTRATIONS?

REASON #1 – To Reduce Detail Burden in the Text

HOW?	WHEN?	Page
A. Integrate Text With Visuals	Describing Assembly or Disassembly	139
	Describing Operation or Functioning	140
	Describing Coordinated Team Activity	141
B. Use Visuals to Expand or Extend Information in Text	Describing Conditions Under Which a Certain Type of Equipment Should Be Used	142
	Describing Conditions Under Which a Certain Technique Should Be Used	143
	Describing the Various Members of a Class of Equipment	144
	Describing a Technique Requiring Use of Specialized Terms	145

REASON #2 – To Emphasize Points in the Text

HOW?	WHEN?	Page
A. Visually Confirm Information in the Text	Describing How to Align or Position Something	146
	Describing a General Plan or Procedure	147
	Describing an Overview of a Complex Plan	148

REASON #3 – To Motivate Users to Read the Material

HOW?	WHEN?	Page
A. Use Cartoons, Drawings and Color	Drawings to Help the Reader Visualize Information Presented	151
	Cartoons to Attract Attention of Young Adults of Lower Reading Levels	153, 155
	Color to Draw Attention to Information You Wish to Emphasize	157

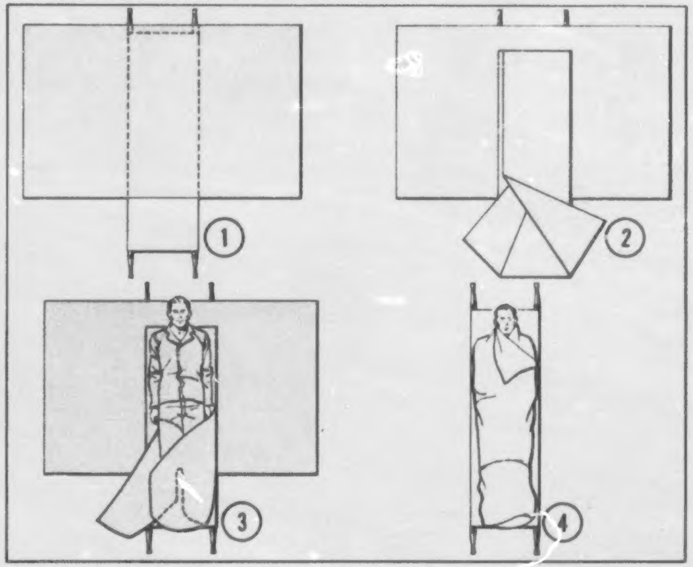
USING ILLUSTRATIONS: REASON #1—TO REDUCE DETAIL BURDEN IN THE TEXT

How? **(a) Integrate Text With Visuals (Self-Contained Illustrations)**

When? (1) You are writing a description of how to do something; for example, put something together or take it apart. You want to convey action by words but parts and location by visual aids.

For Additional Examples See Chapter 5, pages:

79
133



1. Place the first blanket lengthwise across litter with the blanket edge close to or just beyond the head end of litter.
2. Fold second blanket in thirds, lengthwise, and place over the first, the upper edge of this folded blanket being about 10 inches below the upper edge of the first blanket. The exact position of the second blanket depends upon the height of the patient. (Place lower on litter for taller men.) Open folds of second blanket for about 2 feet at the foot end.
3. To wrap patient, place him in position on the second blanket. Bring bottom of blanket up over the patient's feet, with a small fold between the feet. Tuck the two open folds closely over and around the feet and ankles.
4. Finally, wrap first one, then the opposite, side of the first blanket over patient.

Figure 84. Dressing the litter (with two blankets).

How? **(a) Integrate Text With Visuals (Self-Contained Illustrations)** *(Cont'd)*

When? 2) You are writing a description of how something works. You are identifying its component parts, what happens at each stage and the purpose of each part.

For Additional Examples
See Chapter 5, pages:

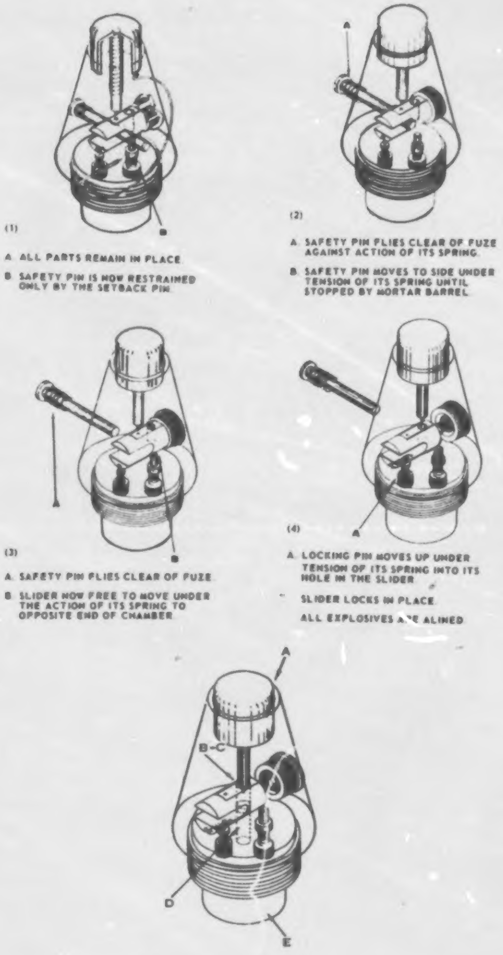
73
77
79
85

47. Point Detonating Fuze, M524E2

a. General. This is a dual purpose fuze used with the 81-mm high-explosive round or with the smoke WP round. The PD fuze M524E2 is designed for superquick impact action with greater sensitivity and speed than fuzes previously used with 81-mm rounds. The fuze PD M524E2 contains a delayed arming feature which insures that the fuze will remain unarmed and the detonator safe for a minimum of 1.25 seconds of flight from the muzzle of the mortar but will arm within a maximum of 2.25 seconds from the muzzle of the mortar. An integral booster is in the bottom of the fuze (fig. 19).

b. Preparation for Firing.

(1) Turn the slot in the striker (at the nose of the fuze) to aline with the SQ index or the D index on the fuze body, depending upon which action of the fuze is desired.
(2) Remove the safety pull wire just prior to insertion of the round into the mortar.



(1)

A. ALL PARTS REMAIN IN PLACE.
B. SAFETY PIN IS NOW RESTRAINED ONLY BY THE SETBACK PIN.

(2)

A. SAFETY PIN FLIES CLEAR OF FUZE AGAINST ACTION OF ITS SPRING.
B. SAFETY PIN MOVES TO SIDE UNDER TENSION OF ITS SPRING UNTIL STOPPED BY MORTAR BARREL.

(3)

A. SAFETY PIN FLIES CLEAR OF FUZE.
B. SLIDER NOW FREE TO MOVE UNDER THE ACTION OF ITS SPRING TO OPPOSITE END OF CHAMBER.

(4)

A. LOCKING PIN MOVES UP UNDER TENSION OF ITS SPRING INTO ITS HOLE IN THE SLIDER.
SLIDER LOCKS IN PLACE.
ALL EXPLOSIVES ARE ALINED.

(5) ACTION ON IMPACT.

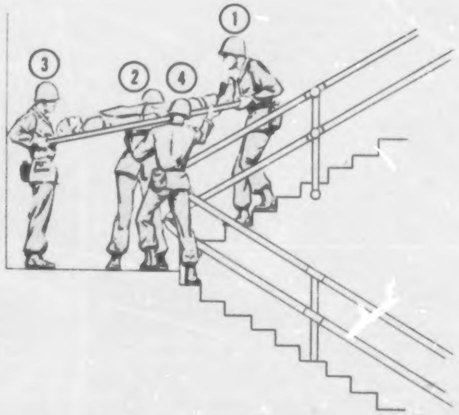
A. STRIKER AND FIRING PIN ARE FORCED IN AGAINST ACTION OF THE SPRING.
B. FIRING PIN CRUSHES DETONATOR.
C. DETONATOR EXPLODES.
D. BOOSTER LEAD EXPLODES.
E. BOOSTER CHARGE EXPLODES TNT FILLER OF CARTRIDGE DETONATES.

Figure 19. Functioning of M524E2 fuze.

USING ILLUSTRATIONS: REASON #1—TO REDUCE DETAIL BURDEN IN THE TEXT (Cont'd)

How? **(a) Integrate Text With Visuals (Self-Contained Illustrations)** *(Cont'd)*

When? (3) You are writing a description of what each member of a team does when performing a task requiring close cooperation and coordination.



No. 1 and No. 3, with No. 2 and No. 4 assisting, then lift litter over banister to second flight of stairs.

Figure 98. Carrying litter upstairs where landings are small (step three).

How? **(b) Use Visuals to Extend or Expand on Information in Text (Complementary Use)**

When? (1) You are writing to tell the user when or how he should use certain equipment or techniques. You also want to give some details about the equipment or techniques without loading this detail into the text.

For Additional Examples
See Chapter 5, pages:

51
61
85
135

74. Field Expedient Directional Antennas

The vertical half-rhombic antenna (fig. 47) and the wave antenna (fig. 48) are the two field-expedient directional antennas that can be used with the FM radio sets. These antennas are directional and will transmit and receive in the direction of the terminated end. If the transmitter loads poorly, add to or subtract from the length of the antenna. These antennas will normally increase the rated operating range of the FM sets.

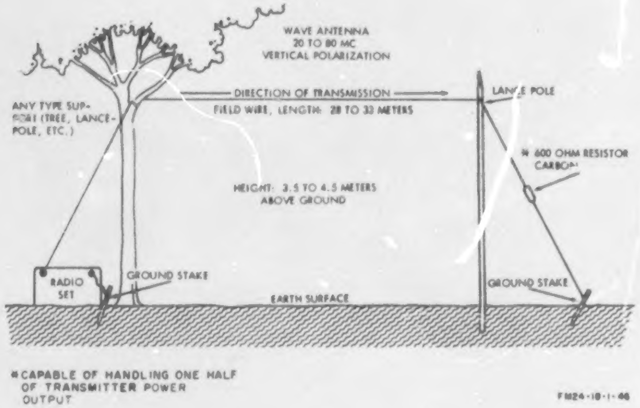

WAVE ANTENNA
20 TO 80 MC
VERTICAL POLARIZATION
ANY TYPE SUPPORT (TREE, LANCE-POLE, ETC.)
DIRECTION OF TRANSMISSION
FIELD WIRE, LENGTH: 28 TO 33 METERS
LANCE POLE
* 600 OHM RESISTOR CARBON
HEIGHT: 3.5 TO 4.5 METERS ABOVE GROUND
RADIO SET
GROUND STAKE
EARTH SURFACE
GROUND STAKE
*CAPABLE OF HANDLING ONE HALF OF TRANSMITTER POWER OUTPUT
FM24-18-1-46

Figure 48. Wave antenna.

How? **(b) Use Visuals to Extend or Expand on Information in Text (Complementary Use)** *(Cont'd)*

When? (2) You want the text to carry the information about *when* he will use a technique and need only a brief example or description of *how* the technique is performed.

For Additional Examples
See Chapter 5, pages:

83
97

d. Measuring Angles. When instruments are not available, measure angles by the hand or fingers held at arm's length from the eye. Determine the angle subtended by each before you go into the field. These angles may vary from the angles shown in figure 43.

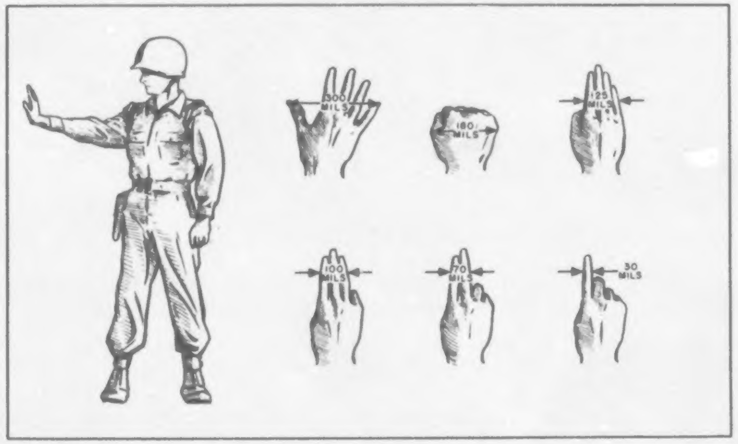


Figure 43. Measurement of angles by hand and fingers.

How? **(b) Use Visuals to Extend or Expand on Information in Text (Complementary Use)** *(Cont'd)*

When? (3) You are trying to help the user identify the different types of a general class of equipment he will use.

b. Several types of transmitting antennas are shown in figure 33.

(1) A is a long-wire nonresonant antenna that is used in large fixed-station installations.

(2) B is a half-wave Hertz antenna that is fed by a resonant (tuned) feeder line from the transmitter.

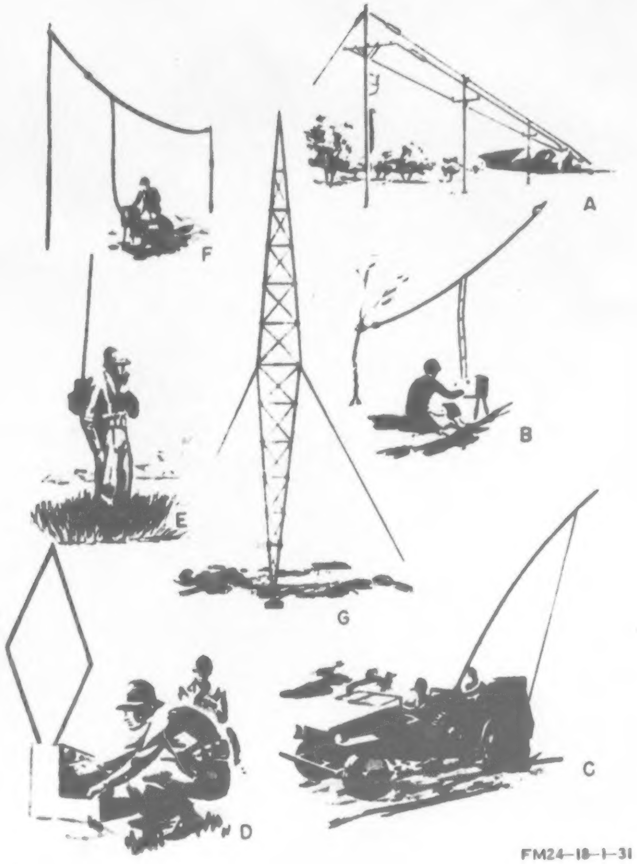
(3) C is an end-fed, vertical, modified Marconi antenna, also called a whip antenna.

(4) D is a loop antenna that radiates a strong signal in some directions and almost no signal in other directions.

(5) E is a Marconi antenna.

(6) F is a half-wave Hertz antenna that is fed by a nonresonant (untuned) feeder line from the transmitter.

(7) G is a fixed-station radiator that may be hundreds of feet high.



FM24-18-1-31

Figure 33. Types of transmitting antennas.

How? **(b) Use Visuals to Extend or Expand on Information in Text (Complementary Use)** *(Cont'd)*

When? (4) You are writing to tell the user how to perform some activity that requires use of special terms. You want to keep the text focused on *how* but also give the reader a definition of the terms.

For Additional Examples
See Chapter 5, page:
40

118. Adjustment of Sheaf

It may be necessary for the observer to adjust the sheaf of a section to correct for any errors made in laying the section parallel or to obtain a special sheaf. The front covered by any sheaf is the width of the sheaf plus the width of a burst. The types of sheaves which may require adjustment are parallel and special. A special sheaf may be converged, open, or closed (fig. 45).

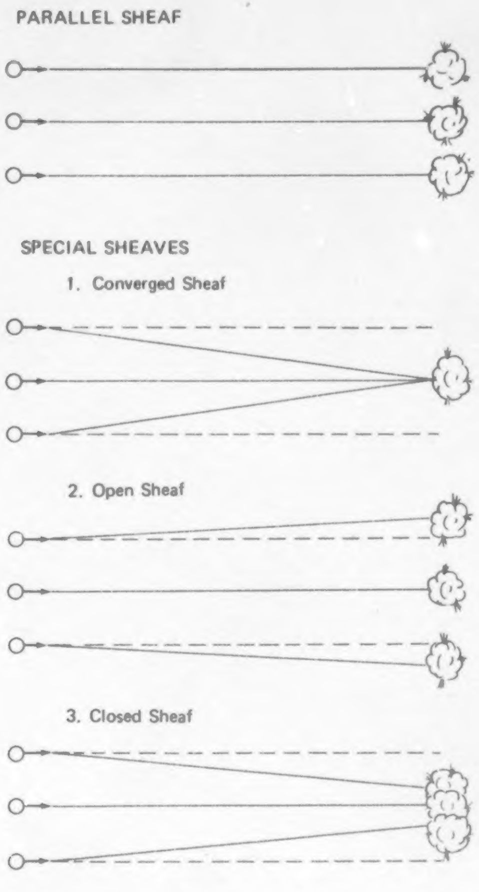


Figure 45. Types of sheaves.

USING ILLUSTRATIONS: REASON #2—TO EMPHASIZE POINTS IN THE TEXT

How? (a) Visually Confirm Information in the Text

When? (1) You are writing a description of how the user should carry out some activity. You want to show him how it should look if he has done it correctly.

For Additional Examples
See Chapter 5, pages:

59
71
95
117

d. Select an aiming point beyond the range to any likely target. With the eye held several inches behind the breech, aline the axis of the bore on the aiming point by elevating and traversing the rifle.

e. Look through the telescope and insure that the boresight cross of the sight reticle is alined on the same aiming point. If the boresight cross is not alined, bring it to the aiming point by rotating the elevation and azimuth correction screws with the screwdriver end of the combination wrench. Recheck the alinement through the bore and through the sight. When the sight and the bore are properly alined on the aiming point, the 90mm rifle is boresighted (fig. 42).

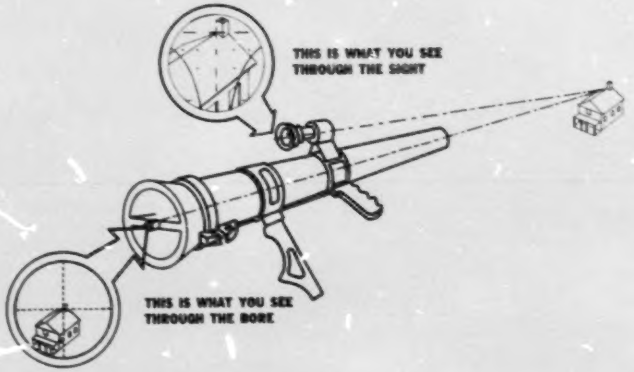


Figure 42. Sight picture in boresighting.

How? **(a) Visually Confirm Information in the Text** *(Cont'd)*

When? (2) You are writing a description of equipment, or a general plan or procedure for doing something. You want to help the user visualize the equipment, plan or scheme you have described.

For Additional Examples See Chapter 5, pages:

57
67
91
105
115
127

89. Overturned Truck

To upright an overturned truck using the wrecker truck, a sling method of attachment must be used on the overturned truck, because a pulling force applied to only one point of the frame will usually result in a bent frame. The sling attachment is made of two utility chains or 1 inch fiber rope. The sling ends are attached to the front and rear lifting shackle on the high side of the overturned truck, and then the winch cable is attached to the center of the sling. A holding effort will be required to prevent the vehicle from crashing onto its wheels. The holding force could be another vehicle or a rope block and tackle with man-power, the attachment for the holding force would be through another sling attached to the same points on the overturned truck as the pulling sling. If a holding vehicle is not available, rig a 4 to 1 mechanical advantage tackle from the equipment on the wrecker truck, attach it between the holding sling and an anchor, and wrap its fall line around a tree as illustrated in figure 99. Apply power gradually to the wrecker truck winch until the overturned truck is past the vertical position, and then lower the truck to its wheels with the holding tackle. Caution must be exercised to prevent smoking or open flames near the overturned truck, because of the danger of igniting spilled fuel and oil. If neither holding vehicle nor holding tackle can be used, the wrecker boom may be used to hold the load. Whenever the wrecker boom is used in this manner, maximum use of the boom jacks should be made. When lowering the overturned truck to its wheels, always lower it using the hoist winch, rather than booming out with the crane.

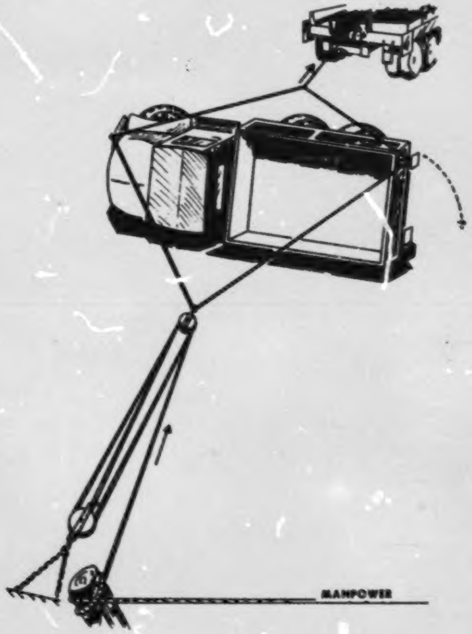


Figure 99. Recovery of overturned truck.

How? **(b) Highlight or Summarize Main Points in Text**

When? You are describing a plan or a procedure which involves several steps, and each step has supporting detail. You want to emphasize the purpose of the procedure or the main point of some or all of the steps.

For Additional Examples
See Chapter 5, pages:

67
107
131

179. Categories of Maintenance

There are four broad categories of maintenance (fig. 59) that have been defined by the Department of Defense for all services. They facilitate the assignment of maintenance missions and responsibilities within the Department of Defense.

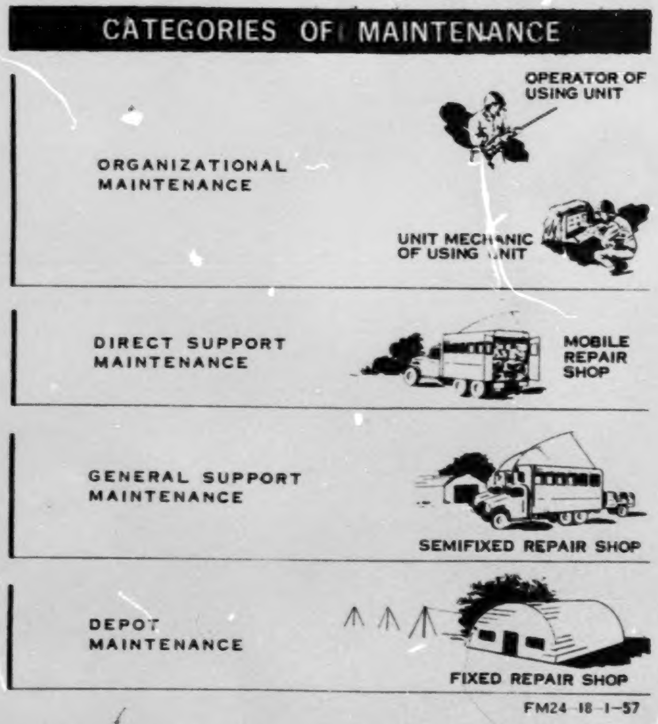

CATEGORIES OF MAINTENANCE
ORGANIZATIONAL MAINTENANCE
OPERATOR OF USING UNIT
UNIT MECHANIC OF USING UNIT
DIRECT SUPPORT MAINTENANCE
MOBILE REPAIR SHOP
GENERAL SUPPORT MAINTENANCE
SEMIFIXED REPAIR SHOP
DEPOT MAINTENANCE
FIXED REPAIR SHOP
FM24-18-1-57

Figure 59. Categories of maintenance.

USING ILLUSTRATIONS: REASON #3–TO MOTIVATE USERS TO READ THE MATERIAL

How?

Use Cartoons, Drawings and Color

When?

Generally, use of colored cartoons would be considered when you have a special problem or procedure you wish to call attention to and your users are young adults or users at the lower reading skill levels.

Color itself is considered useful in drawing readers' attention to information you wish to emphasize.

The pages which follow present some examples of recent efforts within the Army to attract readers attention and to present information in a more directly usable fashion.

Type of Literature: ARMOR - COMBAT

No. of 1 Syll. words/Total No. words: 8/18=44%
FORCAST Reading Grade Level Score: 13.4

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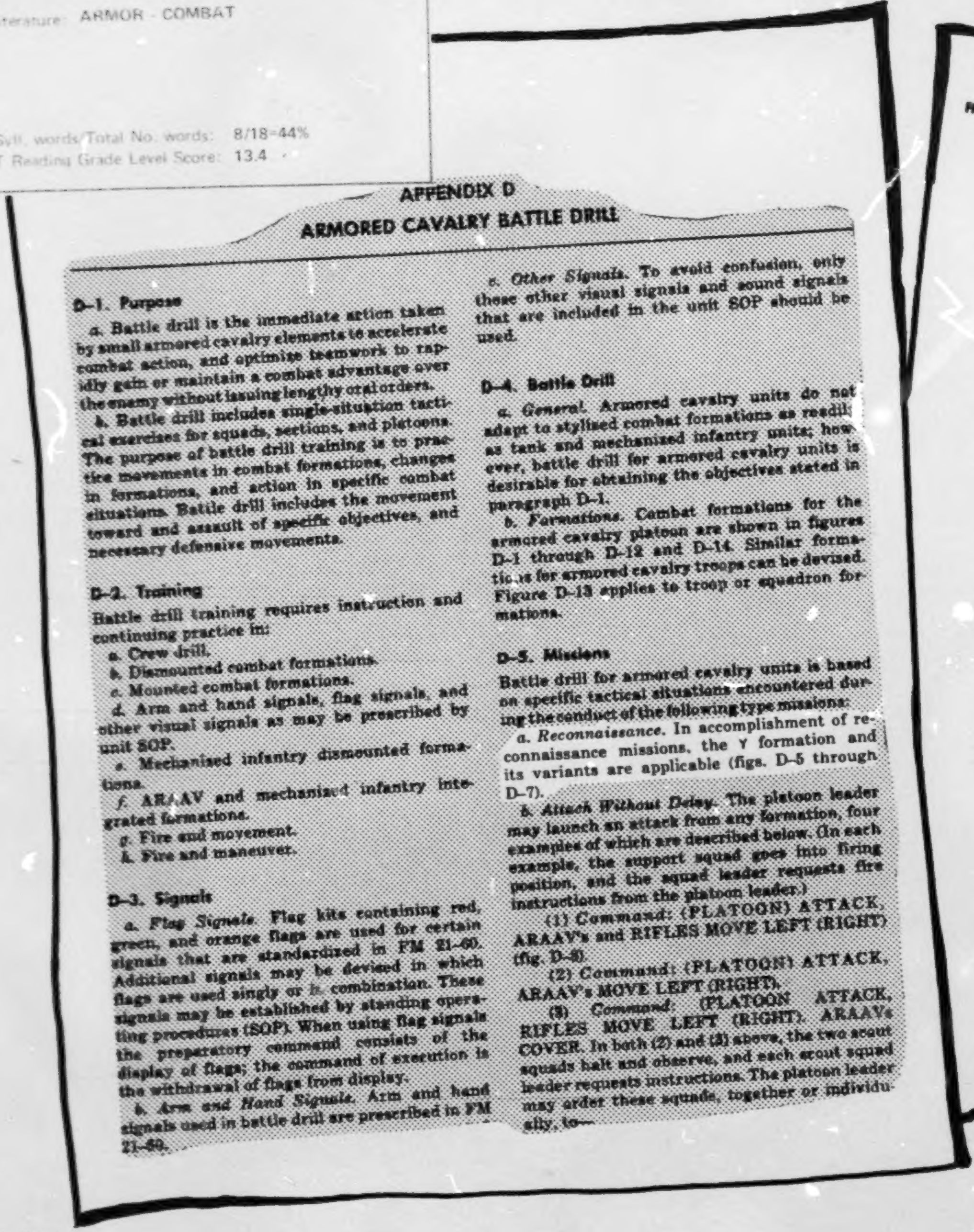


APPENDIX D

ARMORED CAVALRY BATTLE DRILL

D-1. Purpose

a. Battle drill is the immediate action taken
by small armored cavalry elements to accelerate
combat action, and optimize teamwork to rap-
idly gain or maintain a combat advantage over
the enemy without issuing lengthy oral orders.

b. Battle drill includes single-situation tacti-
cal exercises for squads, sections, and platoons.
The purpose of battle drill training is to prac-
tice movements in combat formations, changes
in formations, and action in specific combat
situations. Battle drill includes the movement
toward and assault of specific objectives, and
necessary defensive movements.

D-2. Training

Battle drill training requires instruction and
continuing practice in:

a. Crew drill.
b. Dismounted combat formations.
c. Mounted combat formations.
d. Arm and hand signals, flag signals, and
other visual signals as may be prescribed by
unit SOP.
e. Mechanized infantry dismounted forma-
tions.
f. ARAAV and mechanized infantry inte-
grated formations.
g. Fire and movement.
h. Fire and maneuver.

D-3. Signals

a. Flag Signals. Flag kits containing red,
green, and orange flags are used for certain
signals that are standardized in FM 21-60.
Additional signals may be devised in which
flags are used singly or in combination. These
signals may be established by standing opera-
ting procedures (SOP). When using flag signals
the preparatory command consists of the
display of flags; the command of execution is
the withdrawal of flags from display.

b. Arm and Hand Signals. Arm and hand
signals used in battle drill are prescribed in FM
21-60.

c. Other Signals. To avoid confusion, only
those other visual signals and sound signals
that are included in the unit SOP should be
used.

D-4. Battle Drill

a. General. Armored cavalry units do not
adapt to stylized combat formations as readily
as tank and mechanized infantry units; how-
ever, battle drill for armored cavalry units is
desirable for obtaining the objectives stated in
paragraph D-1.

b. Formations. Combat formations for the
armored cavalry platoon are shown in figures
D-1 through D-12 and D-14. Similar forma-
tions for armored cavalry troops can be devised.
Figure D-13 applies to troop or squadron for-
mations.

D-5. Missions

Battle drill for armored cavalry units is based
on specific tactical situations encountered dur-
ing the conduct of the following type missions:

a. Reconnaissance. In accomplishment of re-
connaissance missions, the Y formation and
its variants are applicable (figs. D-5 through
D-7).

b. Attack Without Delay. The platoon leader
may launch an attack from any formation, four
examples of which are described below. (In each
example, the support squad goes into firing
position, and the squad leader requests fire
instructions from the platoon leader.)

(1) *Command:* (PLATOON) ATTACK,
ARAAV's and RIFLES MOVE LEFT (RIGHT)
(fig. D-8).

(2) *Command:* (PLATOON) ATTACK,
ARAAV's MOVE LEFT (RIGHT).

(3) *Command:* (PLATOON ATTACK,
RIFLES MOVE LEFT (RIGHT). ARAAVs
COVER. In both (2) and (3) above, the two scout
squads halt and observe, and each scout squad
leader requests instructions. The platoon leader
may order these squads, together or individu-
ally, to—

FM 17-36

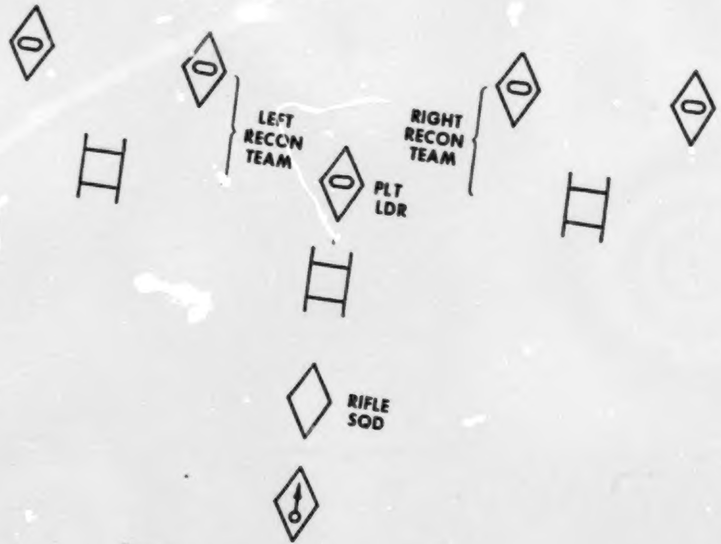
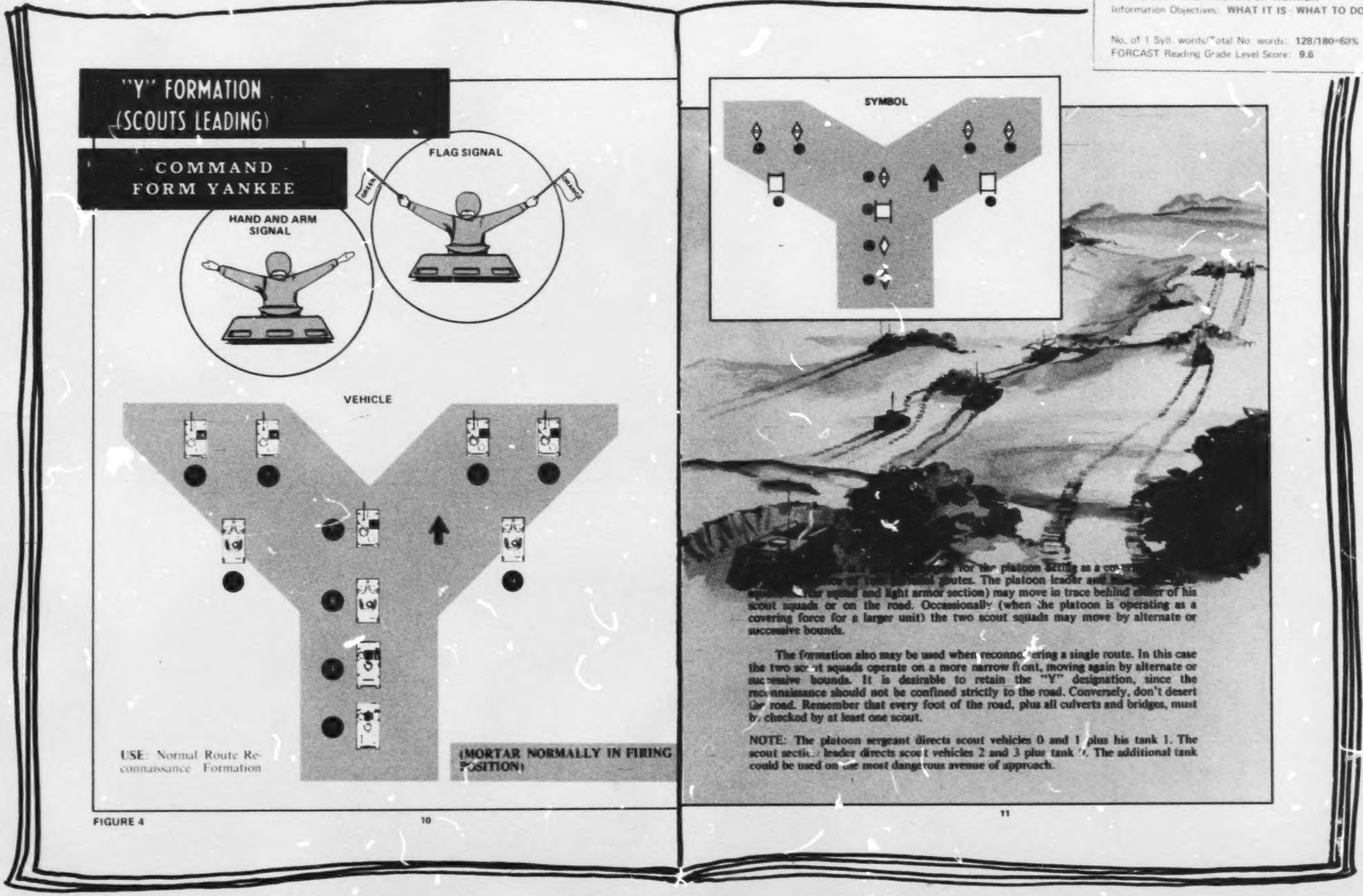


Figure D-5. Armored cavalry platoon, Y formation.

Type of Literature: **ARMOR/CATB - COMBAT**

Primary User: **INSTRUCTOR OF WORKER**
Information Objectives: **WHAT IT IS - WHAT TO DO**

No. of 1 Syll. words/Total No. words: **128/180=63%**
FORCAST Reading Grade Level Score: **9.6**



"Y" FORMATION (SCOUTS LEADING)

COMMAND FORM YANKEE

HAND AND ARM SIGNAL
FLAG SIGNAL
GREEN
ORANGE
VEHICLE
SYMBOL

USE: Normal Route Reconnaissance Formation

(MORTAR NORMALLY IN FIRING POSITION)

FIGURE 4

[illegible] for the platoon acting as a co[illegible] [illegible] of two parallel routes. The platoon leader and [illegible] (mortar squad and light armor section) may move in trace behind either of his scout squads or on the road. Occasionally (when the platoon is operating as a covering force for a larger unit) the two scout squads may move by alternate or successive bounds.

The formation also may be used when reconnoitering a single route. In this case the two scout squads operate on a more narrow front, moving again by alternate or successive bounds. It is desirable to retain the "Y" designation, since the reconnaissance should not be confined strictly to the road. Conversely, don't desert the road. Remember that every foot of the road, plus all culverts and bridges, must be checked by at least one scout.

NOTE: The platoon sergeant directs scout vehicles 0 and 1 plus his tank 1. The scout section leader directs scout vehicles 2 and 3 plus tank [illegible]. The additional tank could be used on the most dangerous avenue of approach.

AFTER

Type of Literature: **ENGINEER - TECHNICAL**
Rewrite Problem(s):

No. of 1 Syll. words/Total No. words: 250/356=70%
FORCAST Reading Grade Level Score: 9.5

B
E
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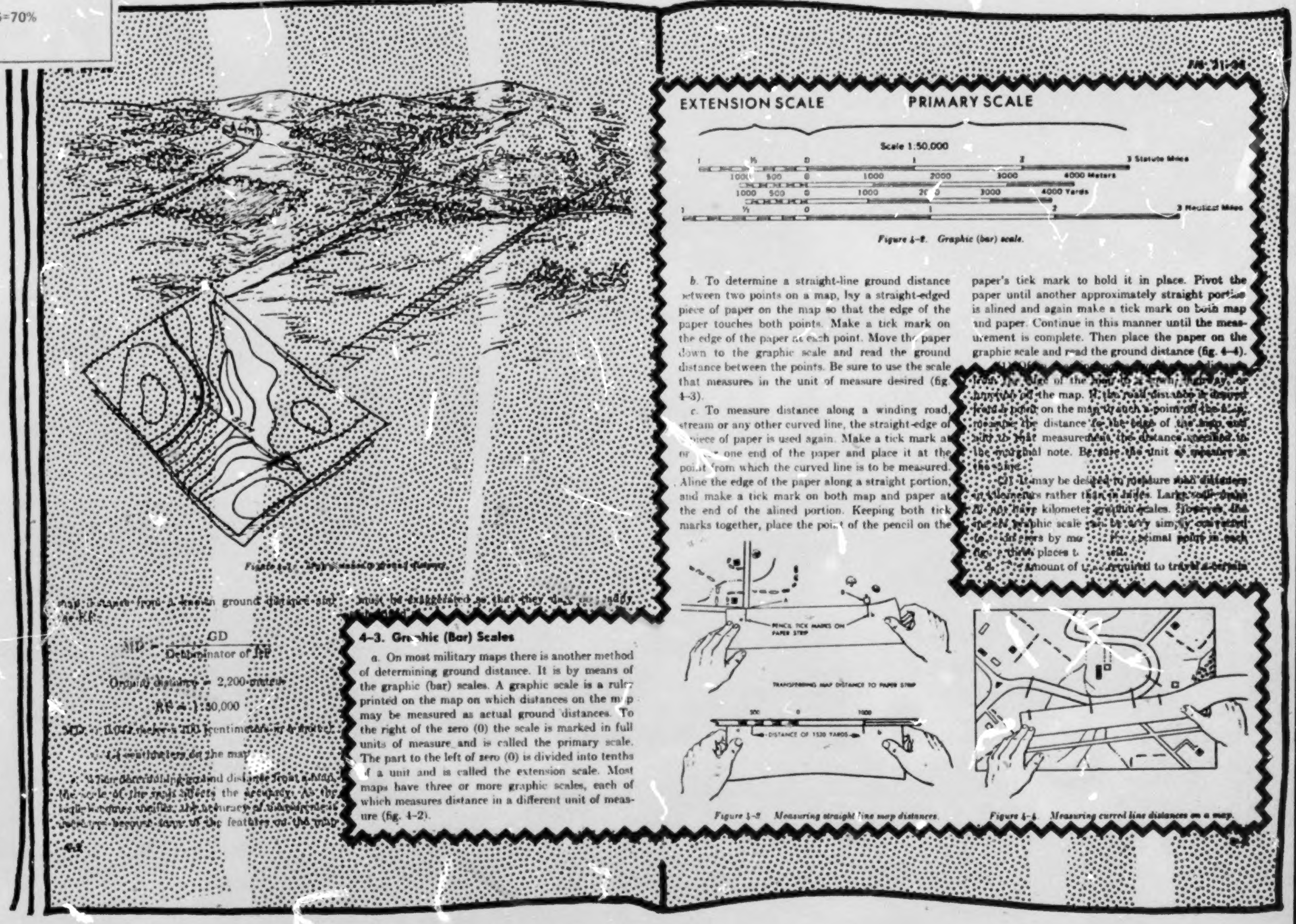
O
R
E



map [illegible] from a known ground distance [illegible] the RF:

$$MD = \frac{GD}{\text{Denominator of RF}}$$

Ground distance = 2,200 meters

RF = 1:50,000

MD = [illegible] 100 (centimeters in a meter)

4.4 centimeters on the map

c. When determining ground distance from a map, the scale of the map affects the accuracy. As the scale becomes smaller, the accuracy of measurement [illegible] many of the features on the map must be exaggerated so that they [illegible]

4–3. Gr[illegible]hic (Bar) Scales

a. On most military maps there is another method of determining ground distance. It is by means of the graphic (bar) scales. A graphic scale is a ruler printed on the map on which distances on the map may be measured as actual ground distances. To the right of the zero (0) the scale is marked in full units of measure and is called the primary scale. The part to the left of zero (0) is divided into tenths of a unit and is called the extension scale. Most maps have three or more graphic scales, each of which measures distance in a different unit of measure (fig. 4–2).

EXTENSION SCALE
PRIMARY SCALE
Scale 1:50,000
1 ½ 0 1 2 3 Statute Miles
1000 500 0 1000 2000 3000 4000 Meters
1000 500 0 1000 2000 3000 4000 Yards
1 ½ 0 1 2 3 Nautical Miles

Figure 4–2. Graphic (bar) scale.

b. To determine a straight-line ground distance between two points on a map, lay a straight-edged piece of paper on the map so that the edge of the paper touches both points. Make a tick mark on the edge of the paper at each point. Move the paper down to the graphic scale and read the ground distance between the points. Be sure to use the scale that measures in the unit of measure desired (fig. 4–3).

c. To measure distance along a winding road, stream or any other curved line, the straight-edge of a piece of paper is used again. Make a tick mark at or near one end of the paper and place it at the point from which the curved line is to be measured. Aline the edge of the paper along a straight portion, and make a tick mark on both map and paper at the end of the alined portion. Keeping both tick marks together, place the point of the pencil on the paper's tick mark to hold it in place. Pivot the paper until another approximately straight portion is alined and again make a tick mark on both map and paper. Continue in this manner until the measurement is complete. Then place the paper on the graphic scale and read the ground distance (fig. 4–4).

[illegible] from the edge of the map to a [illegible] on the map. If the road distance is desired from a point on the map to such a point off the map, measure the distance to the edge of the map and add to that measurement the distance specified in the marginal note. Be sure the unit of measure is the same.

(2) It may be desired to measure road distances in kilometers rather than in miles. Large [illegible] do not have kilometer graphic scales. However, the [illegible] graphic scale can be very simply converted to [illegible] by mo[illegible] decimal point in each fig[illegible] three places t[illegible]

d. [illegible] amount of [illegible] required to travel a certain

PENCIL TICK MARKS ON PAPER STRIP
TRANSFERRING MAP DISTANCE TO PAPER STRIP
500 0 1000
DISTANCE OF 1530 YARDS

Figure 4–3. Measuring straight line map distances.

Figure 4–4. Measuring curved line distances on a map.

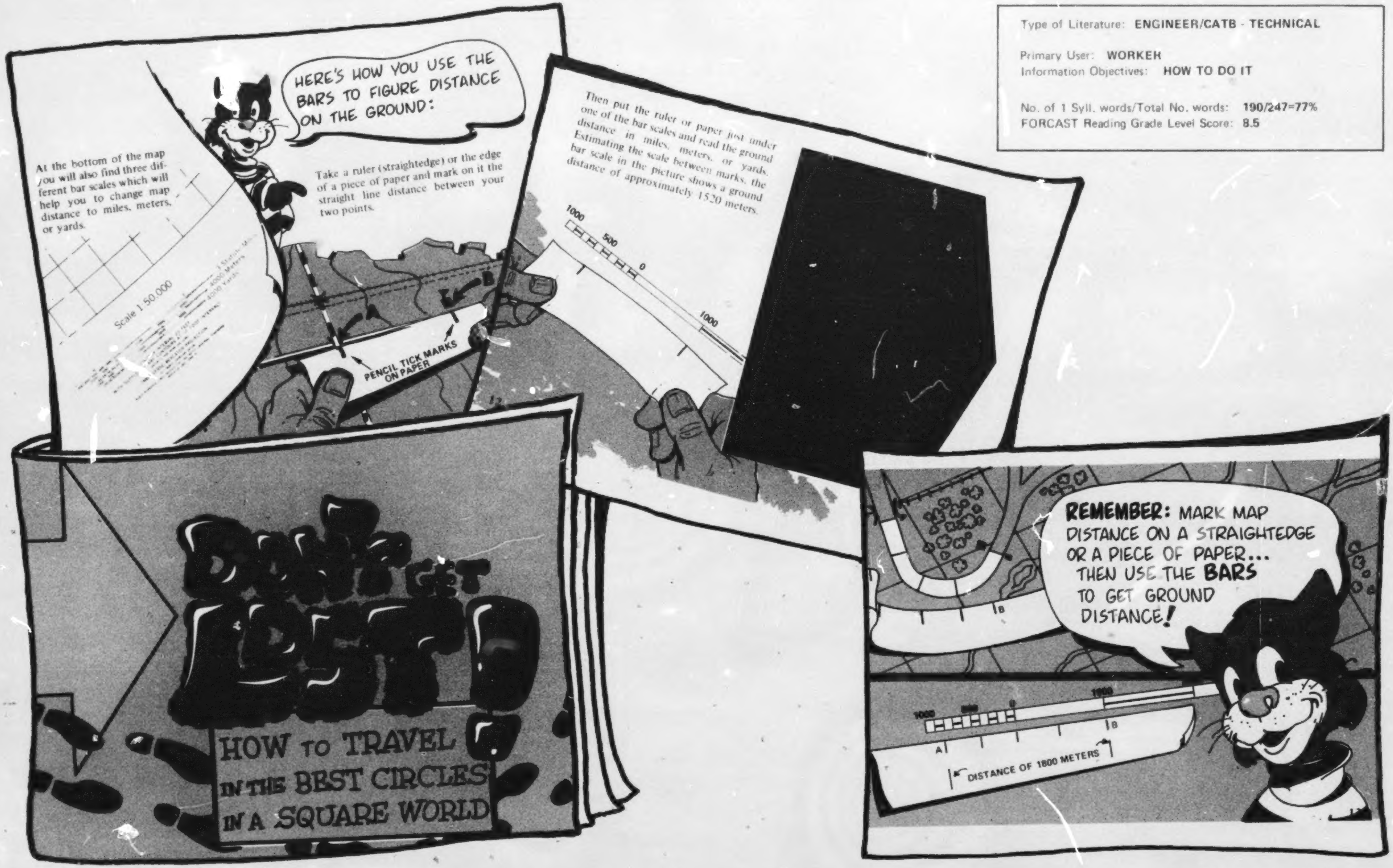
301

302

Type of Literature: **ENGINEER/CATB - TECHNICAL**

Primary User: **WORKER**
Information Objectives: **HOW TO DO IT**

No. of 1 Syll. words/Total No. words: **190/247=77%**
FORCAST Reading Grade Level Score: **8.5**



At the bottom of the map you will also find three different bar scales which will help you to change map distance to miles, meters, or yards.

Take a ruler (straightedge) or the edge of a piece of paper and mark on it the straight line distance between your two points.

Then put the ruler or paper just under one of the bar scales and read the ground distance in miles, meters, or yards. Estimating the scale between marks, the bar scale in the picture shows a ground distance of approximately 1520 meters.

HERE'S HOW YOU USE THE BARS TO FIGURE DISTANCE ON THE GROUND:
Scale 1:50,000
1 Statute Mile
4000 Meters
4000 Yards
A
B
PENCIL TICK MARKS ON PAPER
1000
500
0
1000
DON'T GET LOST!
HOW TO TRAVEL IN THE BEST CIRCLES IN A SQUARE WORLD
REMEMBER: MARK MAP DISTANCE ON A STRAIGHTEDGE OR A PIECE OF PAPER... THEN USE THE BARS TO GET GROUND DISTANCE!
1000
500
0
1900
A
B
DISTANCE OF 1800 METERS

AFTER

Type of Literature: INFANTRY - COMBAT

No. of 1 Syll. words/Total No. words: 336/586=57%
FORCAST Reading Grade Level Score: 11.4

BEFORE

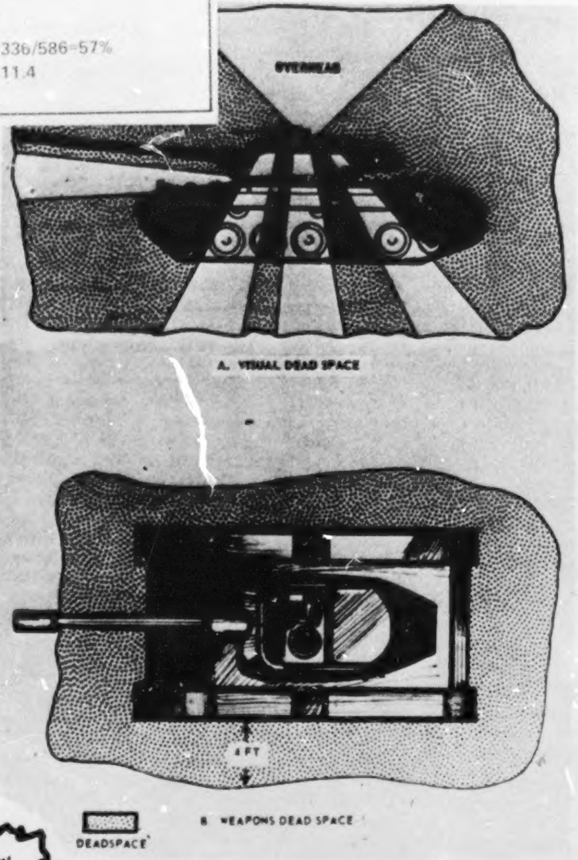


Figure 43. Deadspace (schematic).

97. Tank Vulnerability

[redacted]

b. Even with its great weight and size the tank has vulnerabilities (fig 44), to include the following:

(1) *The degree of armor protection.* It is impossible to provide armor of sufficient thickness throughout a tank that will protect it completely from armor-defeating ammunition. Accordingly, a compromise must be made that will provide greater degrees of protection in certain locations than in others. The amount of protection provided depends on the type of steel, the angle of slope, and the armor thickness. The greatest degree of protection on a tank is on the front of the hull and turret; the least protection is on the sides, rear, top, and undercarriage or "belly." The least protected armor areas, therefore, offer the best chance of being penetrated.

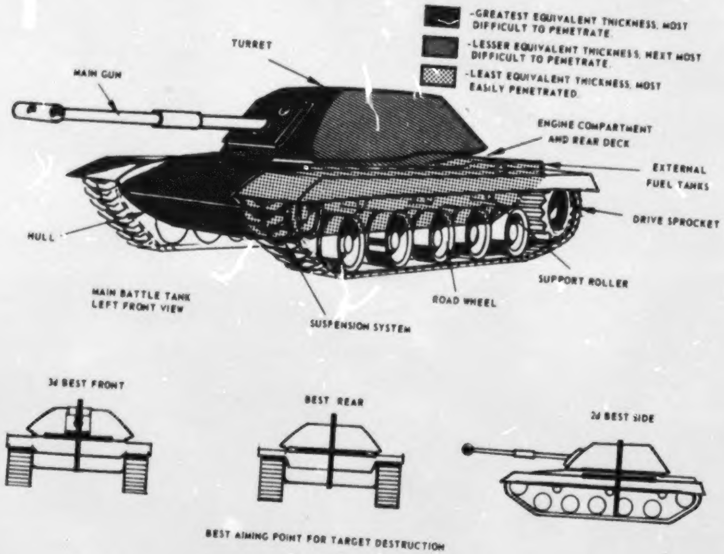

-GREATEST EQUIVALENT THICKNESS, MOST DIFFICULT TO PENETRATE.
-LESSER EQUIVALENT THICKNESS, NEXT MOST DIFFICULT TO PENETRATE.
-LEAST EQUIVALENT THICKNESS, MOST EASILY PENETRATED.
TURRET
MAIN GUN
ENGINE COMPARTMENT AND REAR DECK
EXTERNAL FUEL TANKS
DRIVE SPROCKET
HULL
SUPPORT ROLLER
MAIN BATTLE TANK LEFT FRONT VIEW
ROAD WHEEL
SUSPENSION SYSTEM
3d BEST FRONT
BEST REAR
2d BEST SIDE
BEST AIMING POINT FOR TARGET DESTRUCTION

Figure 44. Tank vulnerability (schematic).

(2) *The engine compartment.* The engine compartment is a particularly vulnerable area. A tank can be stopped by using simple incendiary devices, such as a thermate grenade or napalm. It is unnecessary to destroy the entire engine. Sufficient damage to any critical engine component will prevent the vehicle from running. A disabled tank becomes a stationary pillbox, but it is much easier to destroy.

(3) *The suspension system.* The suspension system (includes the track) is a susceptible area. Properly positioned explosives will break the track, or logs properly placed between the roadwheels may immobilize a tank. It should be pointed out that destruction of roadwheels or support rollers may slow down or hinder tank movement; however, in most instances destruction of roadwheels or support rollers will not stop a tank.

(4) *The fuel system.* Many foreign tanks use both internal and auxiliary fuel tanks. The auxiliary tanks, which are approximately the size of a 55-gallon drum, are mounted on the side or on the rear of the tank. Though normally jettisoned when contact is made with enemy forces, auxiliary fuel tanks are ideal aiming points for surprise attacks by tank-hunter teams. Internal fuel tanks are generally located in the engine compartment, but their exact location will vary with the type of tank.

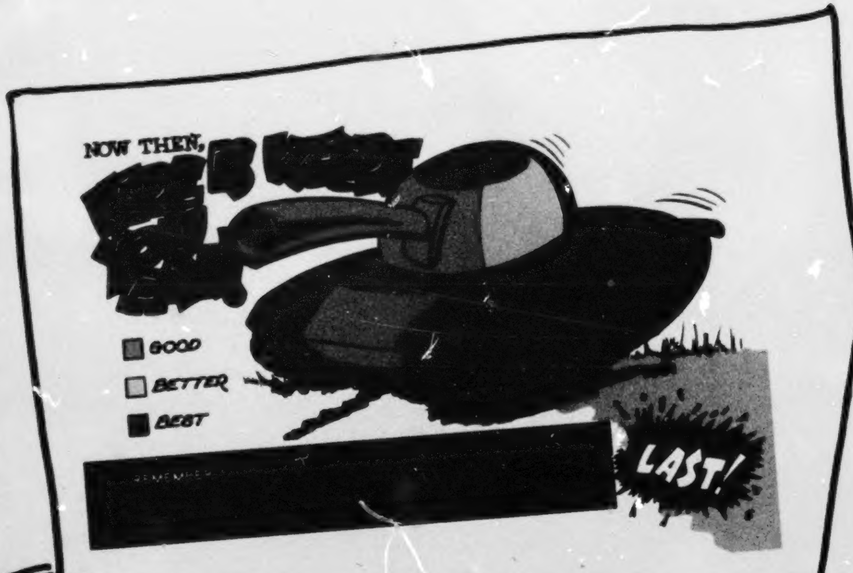
(5) *The weapon systems.* Of all the vulnerable areas on a tank, the most difficult one to destroy is a tank's weapon system. Before an attempt is made to attack this area, a tank should be practically disabled and the crew blinded by smoke. If these factors prevail, dismounted elements can then approach from a blind area and place an explosive charge under the turret overhang in the rear, or over the engine.

[redacted]

Type of Literature: INFANTRY/CATB - COMBAT

Primary User: WORKER
Information Objectives: WHAT IT IS - WHAT TO DO

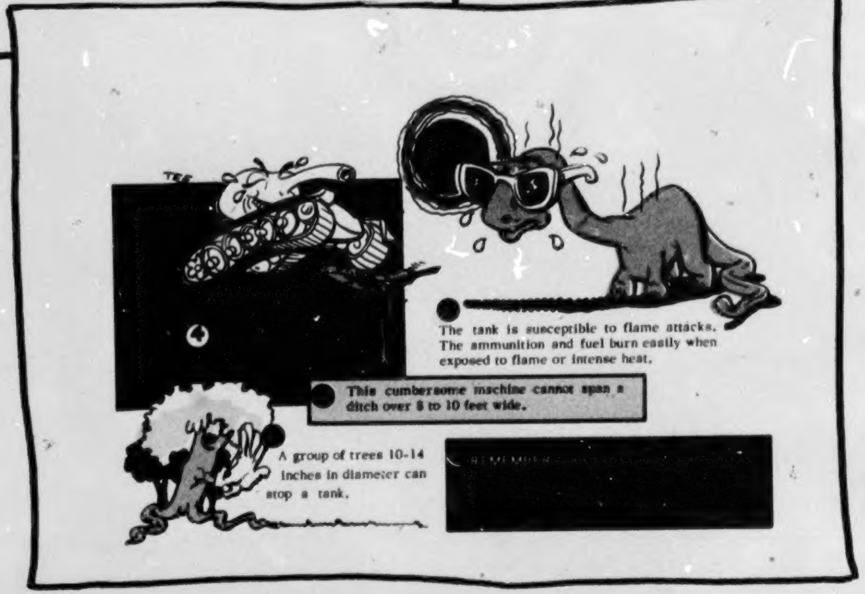
No. of 1 Syll. words/Total No. words: 140/199=70%
FORCAST Reading Grade Level Score: 9.5



THE TANK IS ONLY A MACHINE. LIKE ANY MACHINE, IT CAN BE HANDLED BY MAN. OVER THIS PARTICULAR MACHINE, MAN HAS DEFINITE IMPORTANT ADVANTAGES:
—TANKS CAN'T CLIMB A SLOPE STEEPER THAN 60%. AND THEY CAN'T CLIMB A WALL OVER THREE FEET HIGH!
2
SEE PAGE 5
6

The armor varies in strength on different parts of the tank. Some areas are much weaker than others.

"BIG GAME" HUNTING MADE EASY



The tank is susceptible to flame attacks. The ammunition and fuel burn easily when exposed to flame or intense heat.

This cumbersome machine cannot span a ditch over 8 to 10 feet wide.

A group of trees 10-14 inches in diameter can stop a tank.

A
F
T
E
R

Type of Literature: TJAG - ADMINISTRATIVE

No. of 1 Syll. words/Total No. words: 167/295=57%
FORCAST Reading Grade Level Score: 11.4

BEFORE

Section IV. THE RED CROSS EMBLEM

238. Emblem of the Convention

a. Treaty Provision.

As a compliment to Switzerland, the heraldic emblem of the red cross on a white ground formed by reversing the Federal colours, is retained as the emblem and distinctive sign of the Medical Service of armed forces.

Nevertheless, in the case of countries which already use as emblem, in place of the red cross, the red crescent or the red lion and sun on a white ground, those emblems are also recognized by the terms of the present Convention. (*GWS, art. 38.*)

b. Emblems Other Than the Red Cross. Turkey uses the Red Crescent; Iran, the Red Lion and Sun. Israel signed *GWS* subject to the reservation that it will use a Red Shield of David as its distinctive sign.

c. Misuse of the Emblem. See *Article 23 (f), HR* (par. 52). See also pertinent United States statutes.

239. Use of the Emblem

Under the direction of the competent military authority, the emblem shall be displayed on the flags, armlets and on all equipment employed in the Medical Service. (*GWS, art. 39.*)

[redacted]

[redacted]

55. Improper Use of Distinctive Emblem of Geneva Convention

The use of the emblem of the Red Cross and other equivalent insignia must be limited to the indication or protection of medical units and establishments, the personnel and material protected by *GWS* and other similar conventions. The following are examples of the improper use of the emblem: Using a hospital or other building accorded such protection as an observation post or military office or depot; firing from a building or tent displaying the emblem of the Red Cross; using a hospital train or airplane to facilitate the escape of combatants; displaying the emblem on vehicles containing ammunition or other nonmedical stores; and in general using it for cloaking acts of hostility.

[redacted]

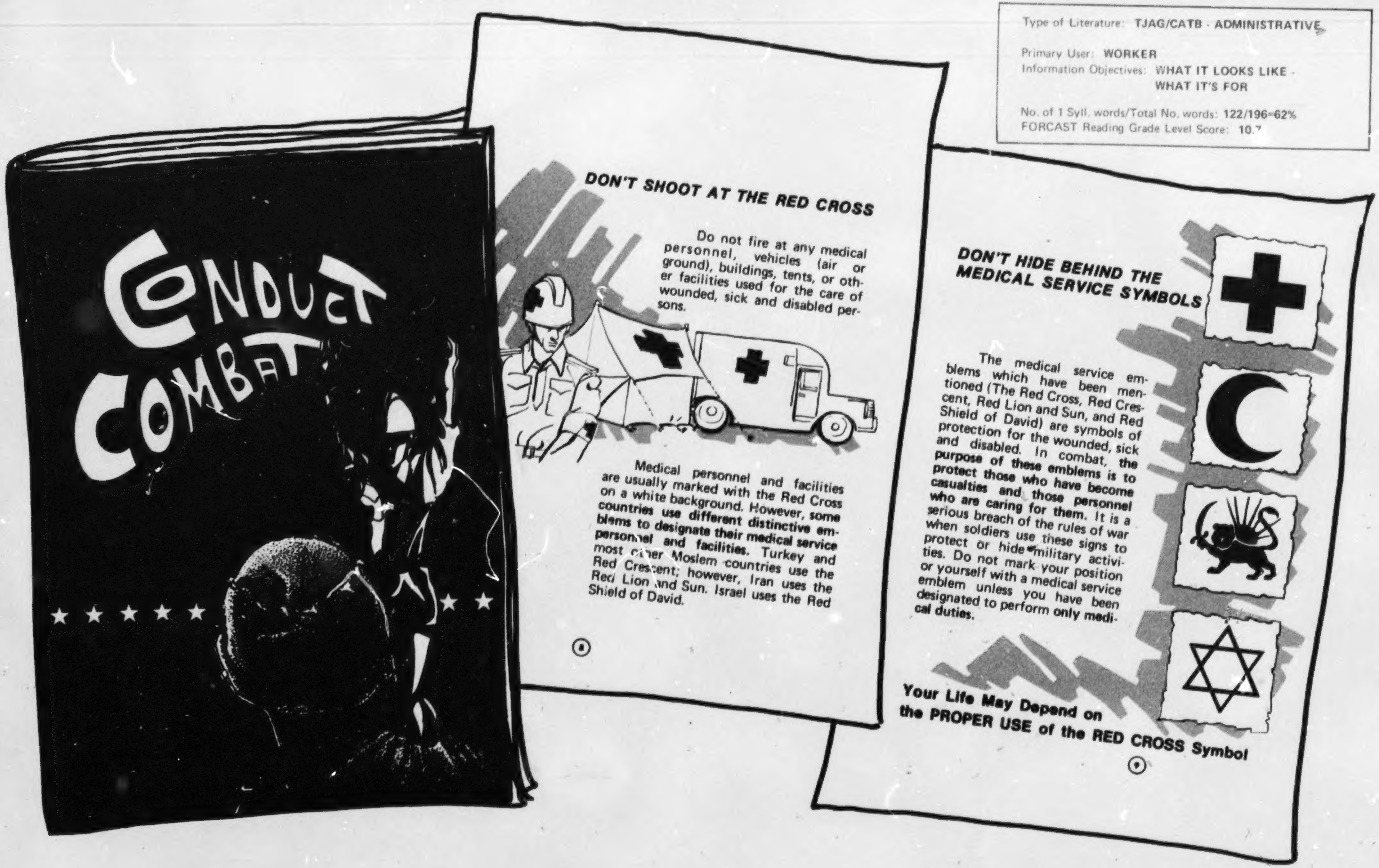
309

310

Type of Literature: **TJAG/CATB - ADMINISTRATIVE**

Primary User: **WORKER**
Information Objectives: **WHAT IT LOOKS LIKE - WHAT IT'S FOR**

No. of 1 Syll. words/Total No. words: **122/196=62%**
FORCAST Reading Grade Level Score: **10.7**


CONDUCT
COMBAT
★ ★ ★ ★ ★ ★ ★

DON'T SHOOT AT THE RED CROSS

Do not fire at any medical personnel, vehicles (air or ground), buildings, tents, or other facilities used for the care of wounded, sick and disabled persons.

Medical personnel and facilities are usually marked with the Red Cross on a white background. However, **some countries use different distinctive emblems to designate their medical service personnel and facilities.** Turkey and most other Moslem countries use the Red Crescent; however, Iran uses the Red Lion and Sun. Israel uses the Red Shield of David.

DON'T HIDE BEHIND THE MEDICAL SERVICE SYMBOLS

The medical service emblems which have been mentioned (The Red Cross, Red Crescent, Red Lion and Sun, and Red Shield of David) are symbols of protection for the wounded, sick and disabled. In combat, **the purpose of these emblems is to protect those who have become casualties and those personnel who are caring for them.** It is a serious breach of the rules of war when soldiers use these signs to protect or hide military activities. Do not mark your position or yourself with a medical service emblem unless you have been **designated to perform only medical duties.**

Your Life May Depend on the PROPER USE of the RED CROSS Symbol

A
F
T
E
R

RETRIEVAL AIDS

Information retrieval aids help the user of the manual to locate the specific information he is seeking. The two most common information retrieval aids are: the Table of Contents, and the Index. The extent to which these two, and other retrieval aids, are *helpful* to the user depends on how much the *needs* of the user were considered when the retrieval aid was written.

THE USER AND HIS NEEDS

Your job, when developing any information retrieval aid is to determine how the user of the manual would ask for information when performing the job. Then develop and organize the information aid around these questions. The closer you can come to the user's question, the more useful the retrieval aid will be to the man performing the job.

CHAPTER 7

INFORMATION RETRIEVAL AIDS FOR YOUR USE

EXAMPLES OF INFORMATION RETRIEVAL AIDS

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Example 2 - Organizing By Tasks 162
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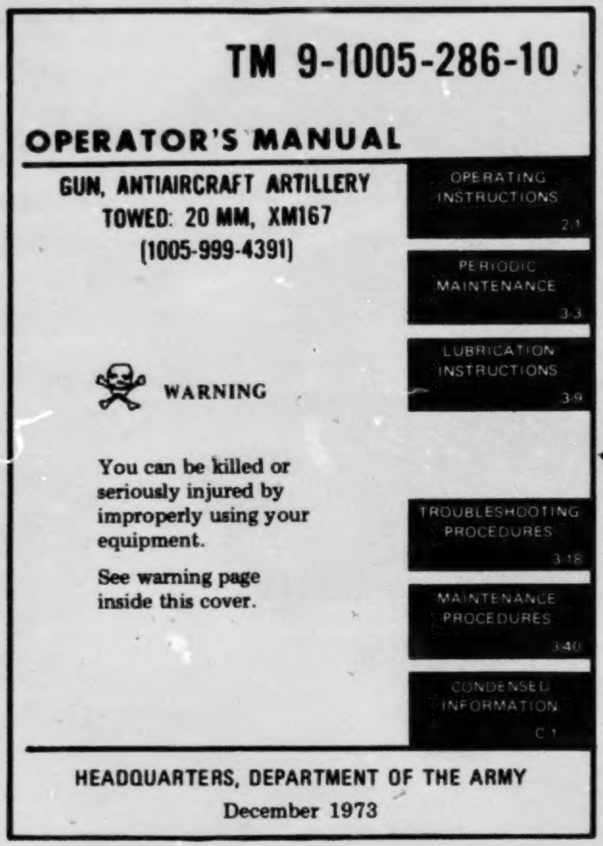
EXAMPLE 1: THE USE OF BLEEDING EDGES AS AN INFORMATION RETRIEVAL AID



TM 9-1005-286-10

OPERATOR'S MANUAL

GUN, ANTIAIRCRAFT ARTILLERY
TOWED: 20 MM, XM167
(1005-999-4391)

OPERATING INSTRUCTIONS 2-1
PERIODIC MAINTENANCE 3-3
LUBRICATION INSTRUCTIONS 3-9
TROUBLESHOOTING PROCEDURES 3-18
MAINTENANCE PROCEDURES 3-40
CONDENSED INFORMATION C-1

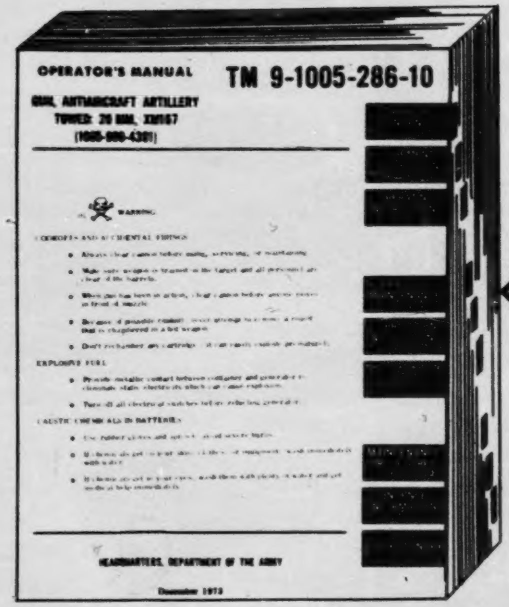
WARNING

You can be killed or seriously injured by improperly using your equipment.

See warning page inside this cover.

HEADQUARTERS, DEPARTMENT OF THE ARMY
December 1973

THE FRONT COVER INCLUDES A PARTIAL TABLE OF CONTENTS. THE ENTRIES INCLUDE ONLY THOSE THAT THE OPERATOR WILL USE MOST OFTEN.



THE ITEMS ARE "KEYED" TO THE EDGE OF THE MANUAL FOR EASY LOCATION.

EXAMPLE 2: ORGANIZING BY TASKS THE USER PERFORMS

B
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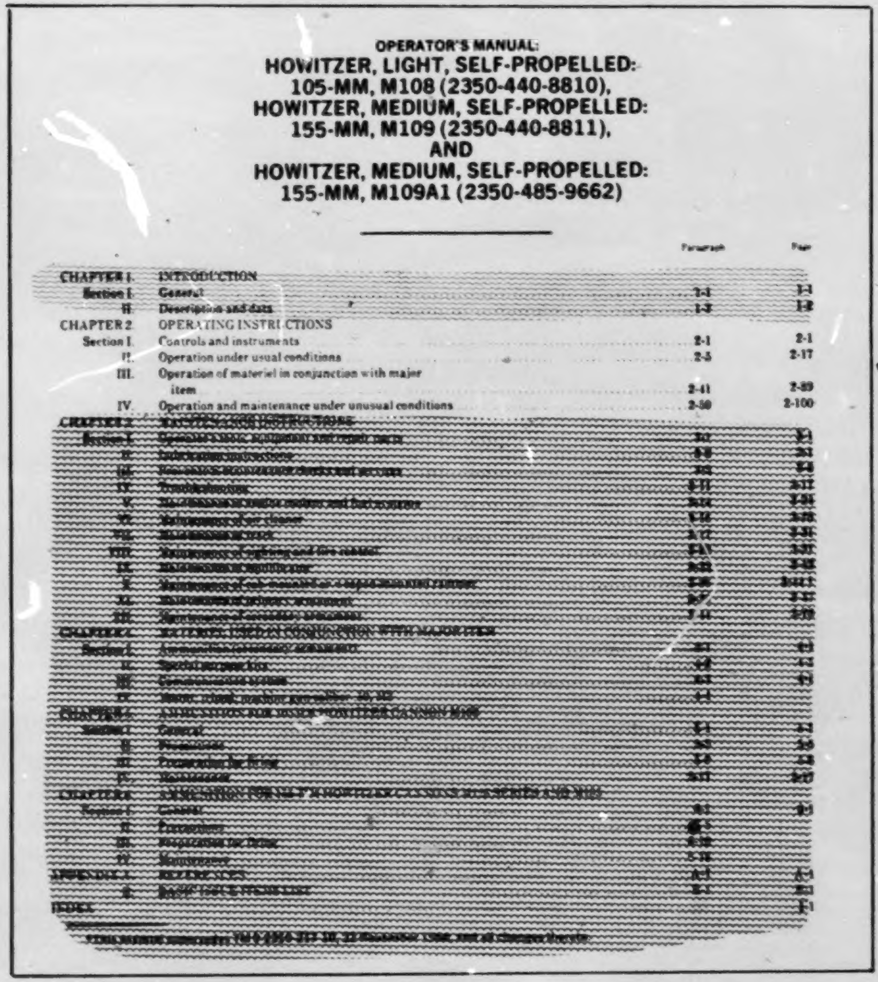
This manual gives information on "operating instructions" in both the Table of Contents and the Index. How useful are these "topic" listings for the man on the job?



OPERATOR'S MANUAL:
HOWITZER, LIGHT, SELF-PROPELLED:
105-MM, M108 (2350-440-8810),
HOWITZER, MEDIUM, SELF-PROPELLED:
155-MM, M109 (2350-440-8811),
AND
HOWITZER, MEDIUM, SELF-PROPELLED:
155-MM, M109A1 (2350-485-9662)

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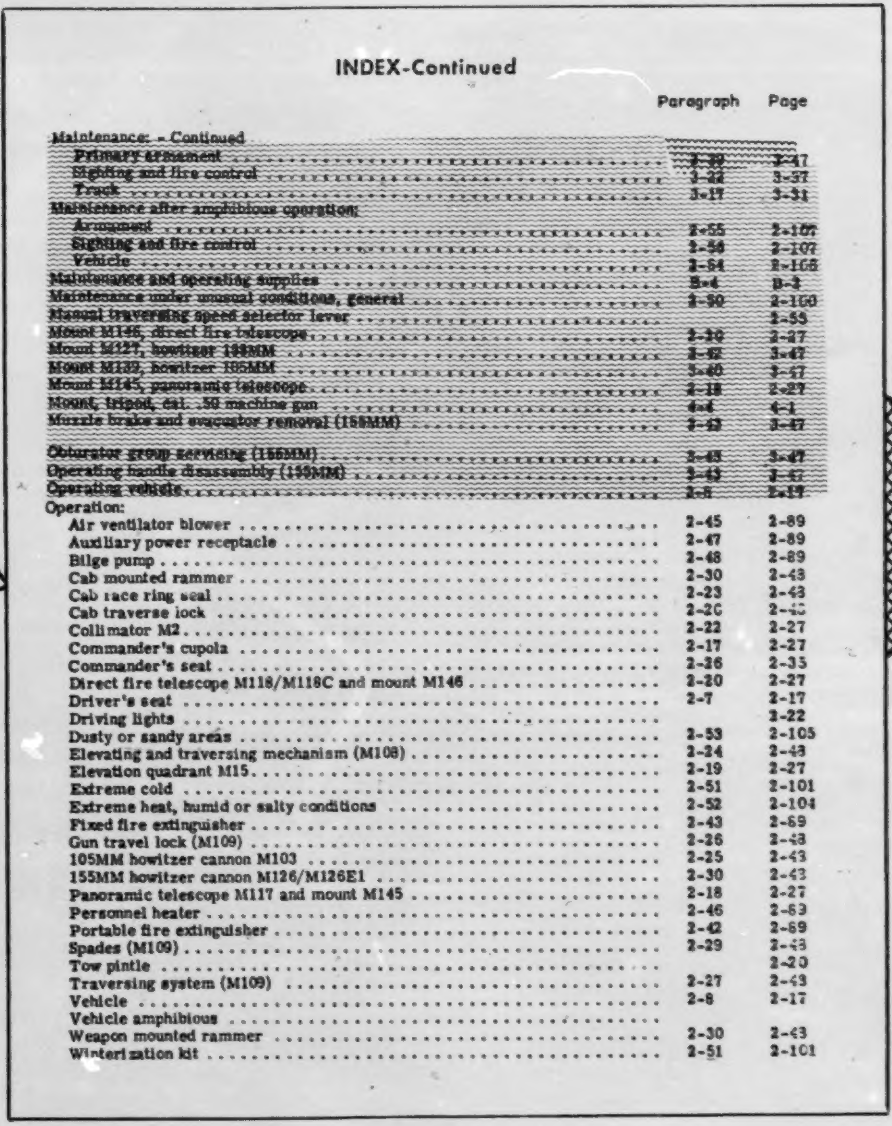
IV.	Operation and maintenance under unusual conditions	2-50	2-100



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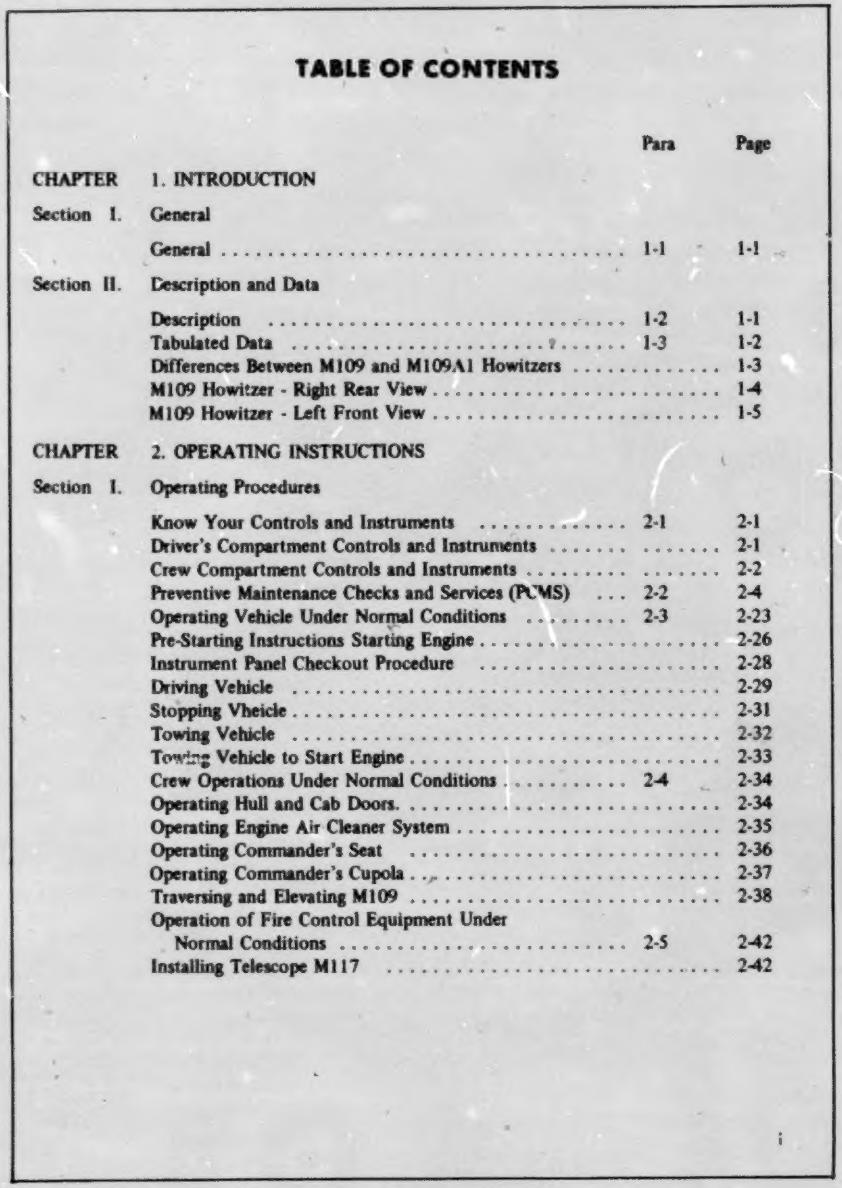
RATHER THAN BY TOPIC



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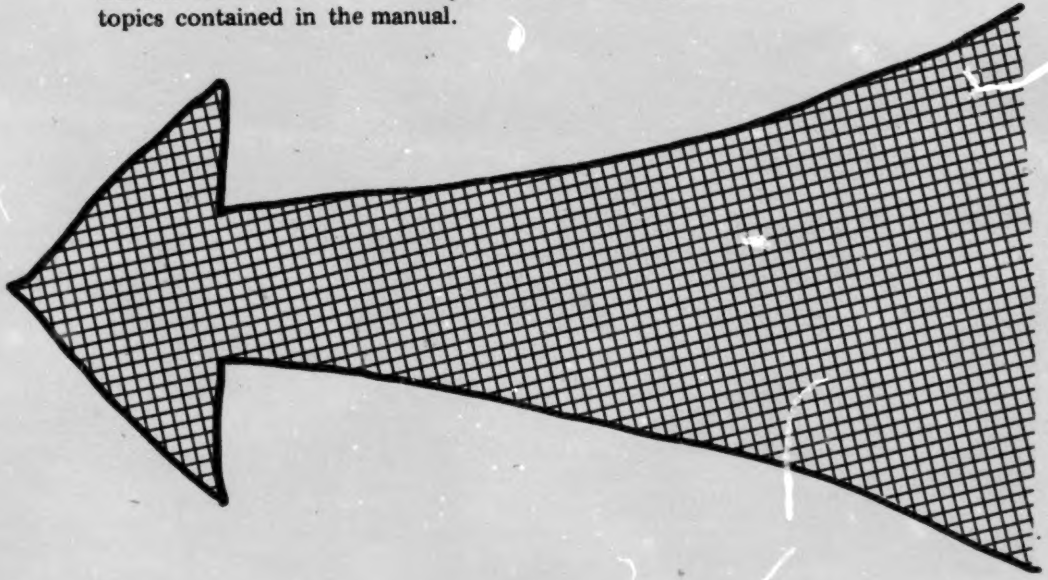
i

ORGANIZE AND LABEL TO
IDENTIFY TASKS THE USER PERFORMS

This is a Table of Contents for a revision of the same manual. Notice the use of action verbs. This information retrieval aid was written for the user and his job. It is not simply a listing of the topics contained in the manual.



AFTER

BEFORE

THE TANK GUNNER'S GUIDE

(Tank, 90-mm Gun, M48A1)

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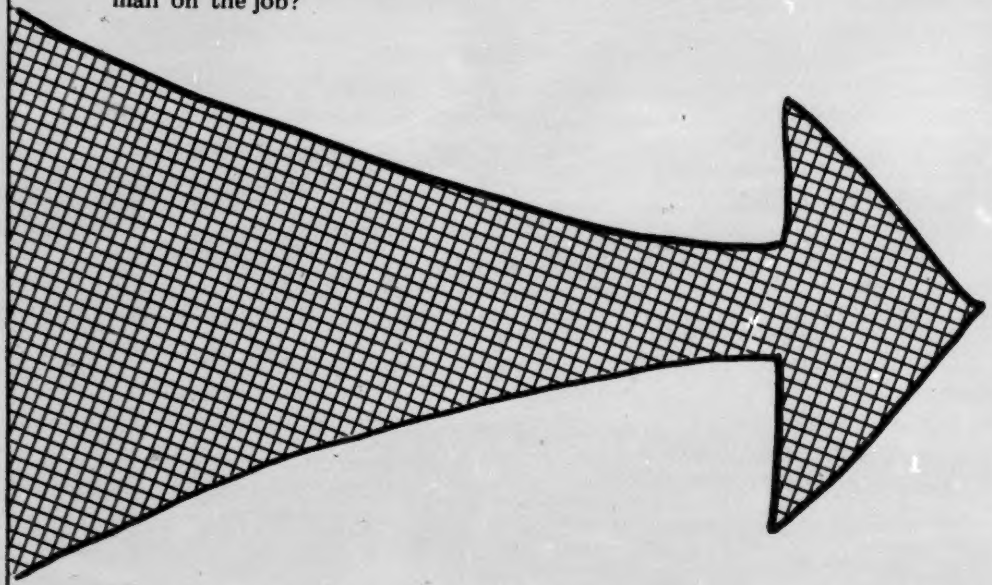
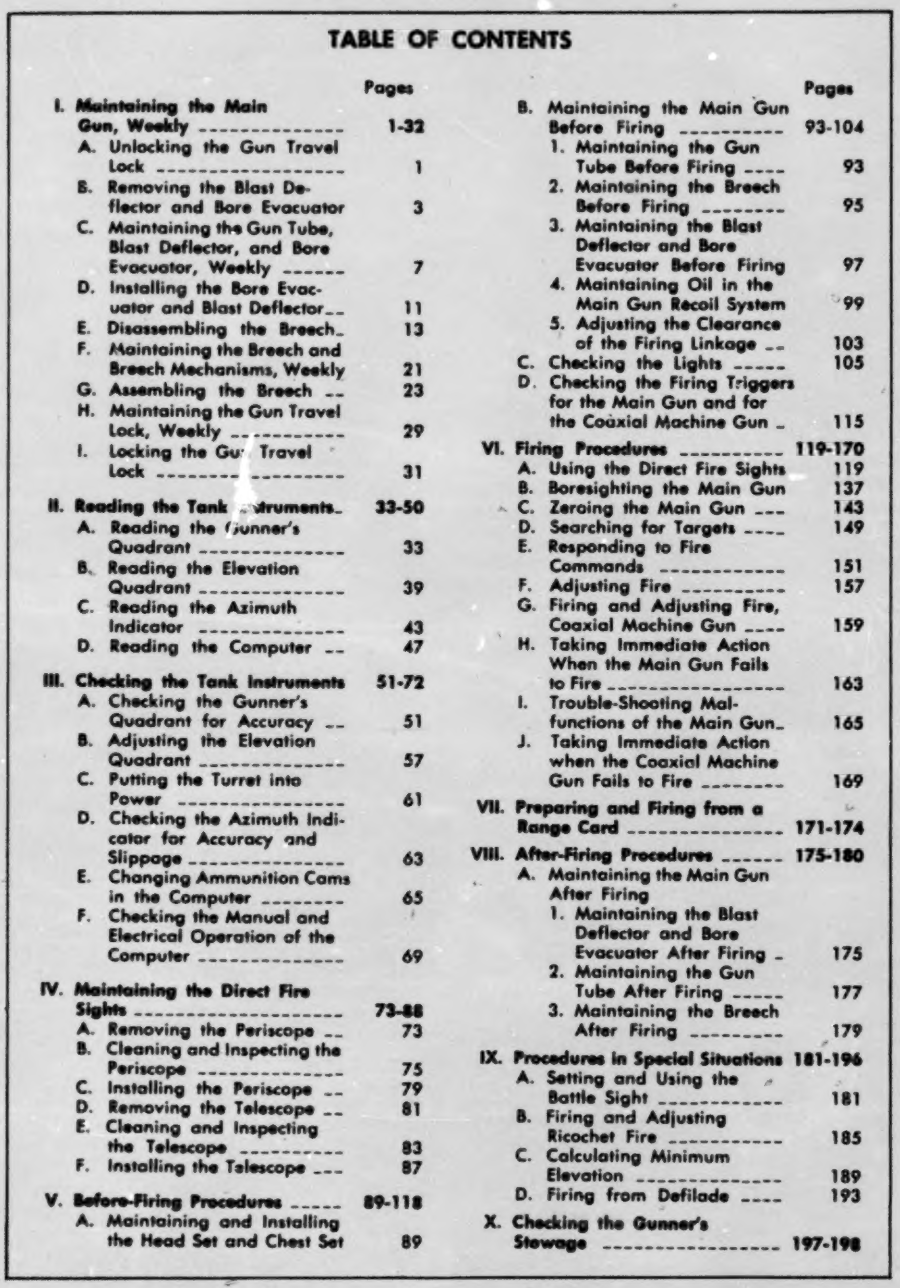
EXAMPLE 3: FORMATTING TO AID VISUAL SCANNING

This Table of Contents and the one on the facing page were both written for the same manual. Which one is more useful for the man on the job?





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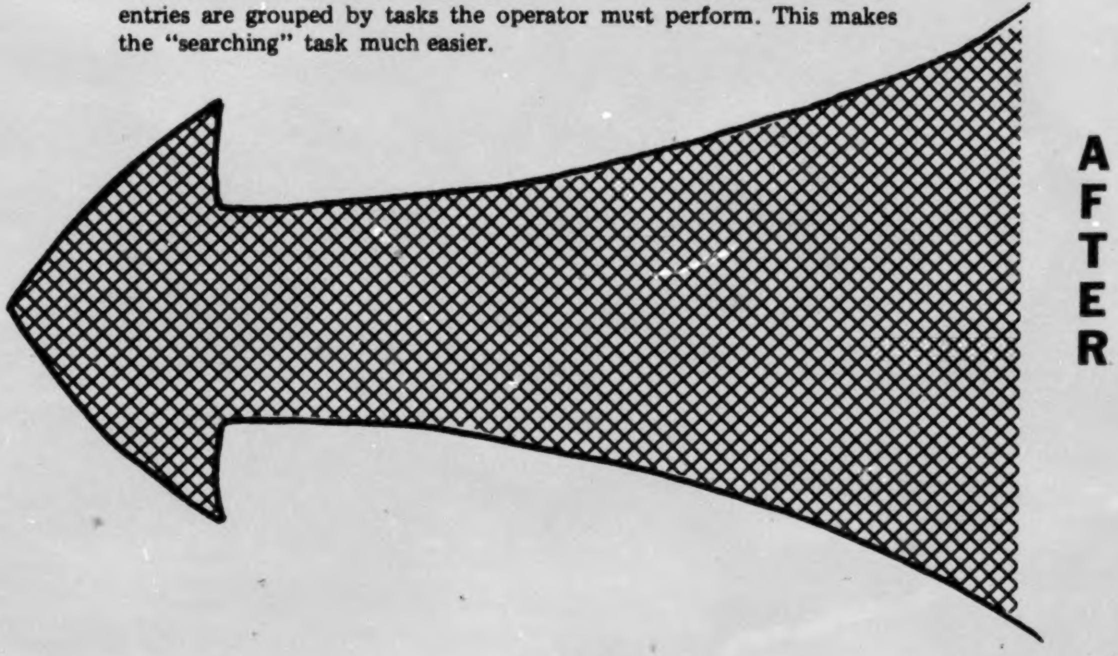
FORMAT AND LABEL TO AID QUICK VISUAL SCANNING

This Table of Contents was written for the user. Notice that the entries are grouped by tasks the operator must perform. This makes the "searching" task much easier.



CHAPTER 8

INFORMATION PRESENTATION TECHNIQUES: A SAMPLER

INTRODUCTION

This chapter presents a "sampler" of several effective methods of presenting information to the user of the manual in other than the standard "textbook" manner.

The purpose of the chapter is to show you several new methods developed by writers to present information in a unique and useful way. If any method seems useful to you—give it a try! If you would like more information about any method, send for the referenced material.

PRIMARY FEATURES

These examples all contain two features which make them appropriate for writers of Army training material. These important features are:

1) The amount of written (prose) material is greatly reduced compared to the standard "textbook" method of presentation.
2) The selections have been designed for ease of use by the *user* of the material.

APPLICATION

The examples presented have application for:

INITIAL LEARNING: They present the user with all the information necessary to initially learn the tasks.

REVIEW: The user can review specific previous material quickly without having to review the entire lesson or chapter.

REFERENCE: They serve as excellent and easy to use reference sources for future use by the user.

SELECTION OF SAMPLES

The samples contained in this chapter were selected on the basis of:

1) Their proven effectiveness within a tested training program, and
2) The application of principles of information processing and display as determined from psychological and educational research.

SAMPLES PRESENTED IN THIS CHAPTER

1) Logic Trees: Logic trees have been used for many purposes and have some definite advantages in certain situations. . . . . . page 169

2) Job Aids: This covers a wide range of materials all designed to assist the man on the job to do his job in the most effective manner. . . . . page 173

LOGIC TREES

LOGIC TREES

A logic tree is a schematic representation of a decision making process. It makes explicit, the logical structure and decision points that are otherwise buried, and often not completely developed in standard narrative text.

PRIMARY FEATURES

Procedures and/or decisions are presented as discrete steps.

All decision points are clearly indicated.

Minimal training required for use.

APPLICATIONS

Logic trees are particularly effective when used for:

- Task Analysis
- Task Inventories
- Test Design
- Lesson Planning
- Determining Sequence of Instruction
- Job Aids
- Supplemental Training Material

EXAMPLES

NARRATIVE TEXT VERSUS LOGIC TREE PRESENTATION

Example 1 -	**Personnel Administration**	**pages 170-171**
Example 2 -	**Weapon Safety Procedures**	**page 172**

REFERENCES

Adams, Elmer E. *The Use of Job Aids as a Method of Instruction*, Fort Benjamin Harrison, Indiana: U.S. Army Adjutant General School, 1968. 14 pp. (Printed).

Gane, C.P., I.S. Horabin, and B.N. Lewis. "Algorithms for Decision Making," *Aspects of Educational Technology*. London: Methuen and Company, Limited, 1966. pp. unk.

Sampson, Jon L., MAJ, AGC. *An Analysis of the Use of a Job Aid (Logic Tree) to Obtain Effective Performance of a Task Without Formal Instruction*, Research Report Number 8. Department of the Army, U.S. Army Adjutant General School, Fort Benjamin Harrison, Indiana. September 1971.

Systems Engineering of Training. U.S. Continental Army Command Regulation 350-100-1. Fort Monroe, Virginia, 1968. 108 pp.

Design and Use of Logic Trees. U.S. Army Adjutant General School Pamphlet 350-100-1. Fort Benjamin Harrison, Indiana, 1969. 9 pp.

EXAMPLE I - LOGIC TREE APPLIED TO

BEFORE THE APPLICATION OF LOGIC TREE ANALYSIS

BEFORE

"c. School assignment. Enlisted personnel selected for training at service schools will be assigned or attached as follows:

(1) Navy and Air Force personnel. In accordance with separate Air Force and Navy directives, Air Force and Navy enlisted personnel, when selected for training at Army service schools, will be attached to schools on temporary duty until returned to their respective Departments upon completion of the course. School commandants are authorized to drop from attachment and report to Director of Military Personnel, United States Air Force or Chief of Naval Operations, Military Personnel Office, United States Navy, personnel who are attached to Army schools contrary to these instructions.

(2) Army personnel.

(a) Army personnel stationed in CONUS ordered to an Army, Navy, or Air Force service school for a course of instruction of less than 20 weeks will be placed on temporary duty at school, provided they are to be returned to their assigned organization whether they do or do not complete school course. They will be returned to their assigned organization upon completion of the course, or earlier if they are relieved prior to completion of the course.

(b) Army personnel stationed in CONUS, ordered to an Army, Navy, or Air Force service school for a course of instruction of less than 20 weeks, and who are not to be returned to their parent installation will be assigned on Temporary Duty Pending Further Orders (TDPFO), as appropriate. EDCSA to be established in orders will be the same as the reporting date to school. Personnel will be assigned to a student detachment as follows:

1. Army service school. Personnel reporting to an Army service school will be assigned direct to student detachment of school. Upon completion of course, or when relieved prior to completion of a course, personnel will be reassigned in accordance with instructions received from the Chief of Personnel Operations, Department of the Army.

2. Navy or Air Force service schools. Personnel reporting to a Navy or Air Force service school will be assigned to student detachment of headquarters of major command in which the school is located, with station at the school. Personnel attending a Navy or Air Force service school will be reported by appropriate major headquarters upon completion of course, or when relieved prior to completion of a course, to Chief of Personnel Operations, for reassignment under AR 614-205. These individuals will also be reassigned as prescribed by Chief of Personnel Operations (exempt report para 39a, AR 335-15).

(c) Army personnel stationed in an overseas command ordered to an Army, Navy, or Air Force service school for a course of instruction of less than 20 weeks will be assigned direct to the new gaining CONUS unit with TDY en route to school designated. EDCSA will be established as prescribed by paragraph 20, AR 330-12.

(d) Army personnel ordered to an Army service school for course of instruction of 20 weeks or longer will be relieved from their unit of assignment and will be assigned on a permanent change of station direct to the student detachment of Army service school. EDCSA to be established in orders for personnel stationed within CONUS will be same date as reporting date to the school. EDCSA to be established in orders for all personnel stationed overseas will be computed as prescribed by paragraph 20, AR 330-12. Upon completion of course, or if relieved prior to completion of course, these individuals will be reassigned in accordance with instructions from the Chief of Personnel Operations.

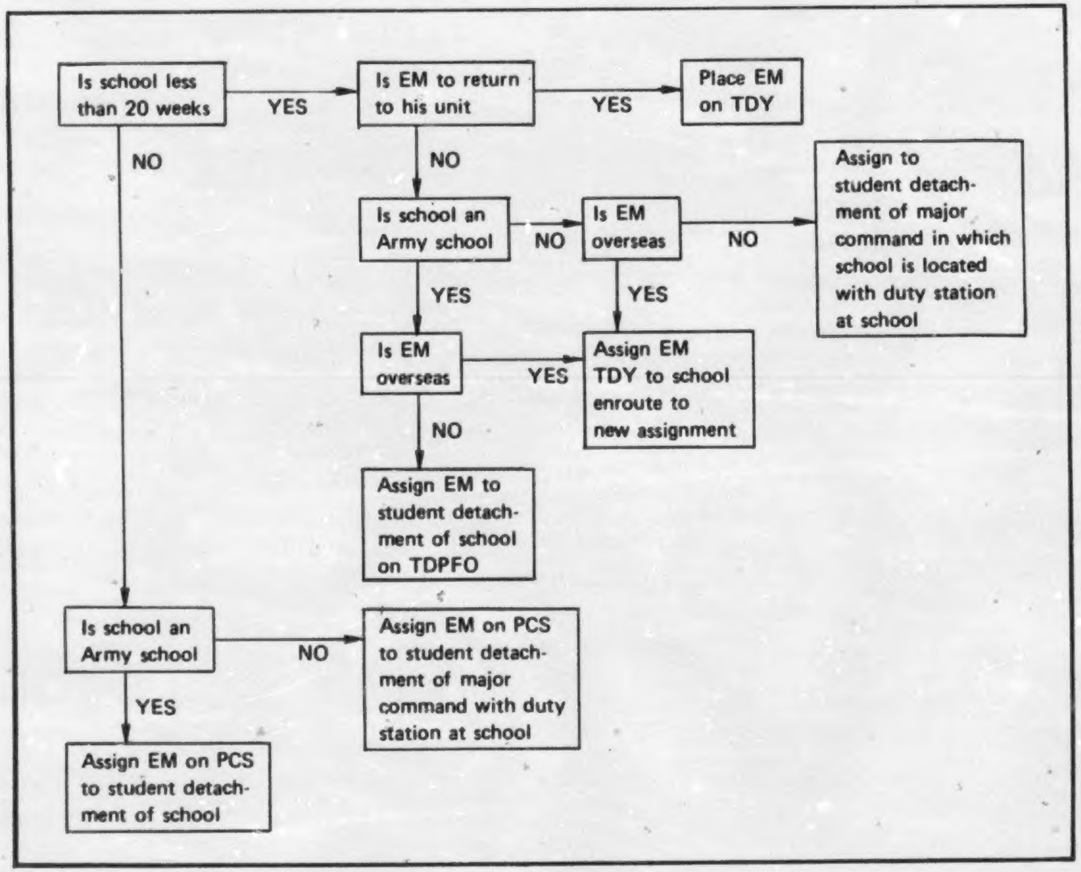
(e) Army personnel ordered to a Navy or an Air Force service school for a course of instruction of 20 weeks or longer will be relieved from their unit of assignment. They will be assigned, on a permanent change of station status, direct to the student detachment of headquarters of major command in which school is located, with station at the school. EDCSA to be established in orders for personnel stationed in CONUS will be the same date as reporting date of individual to the school. EDCSA to be established in orders for all personnel stationed overseas will be computed as prescribed by paragraph 20, AR 330-12. Upon completion of course, or if relieved prior to completion of course, appropriate major headquarters will report individuals to Chief of Personnel Operations, for reassignment under AR 614-205. Individuals will be reassigned as prescribed by Chief of Personnel Operations (exempt report, para 39a, AR 355-15).

(f) Army personnel ordered to a course conducted at a civilian school will be reassigned to, or placed on temporary duty with, student detachment of headquarters of the major command in which the school is located, with station at the school. The major commander will be responsible for accomplishing actions directed in paragraph 4-4c when personnel are relieved from, or complete, the course of instructions. EDCSA to be established in orders for personnel stationed overseas will be computed as prescribed by paragraph 20, AR 330-12.

1. Reassignment will be on a permanent change of station when course is 20 weeks or longer.

2. When course is of less than 20 weeks' duration, individual will be reassigned on a temporary duty basis, or on temporary duty pending further orders (TDPFO), when indicated, except that Army personnel stationed overseas will be assigned in accordance with (c) above."

THE SAME INFORMATION AFTER APPLICATION OF LOGIC TREE ANALYSIS



Is school less than 20 weeks

YES

Is EM to return to his unit

YES

Place EM on TDY

NO

Is school an Army school

NO

Is EM overseas

NO

Assign to student detachment of major command in which school is located with duty station at school

YES

Assign EM TDY to school enroute to new assignment

YES

Is EM overseas

YES

NO

Assign EM to student detachment of school on TDPFO

NO

Is school an Army school

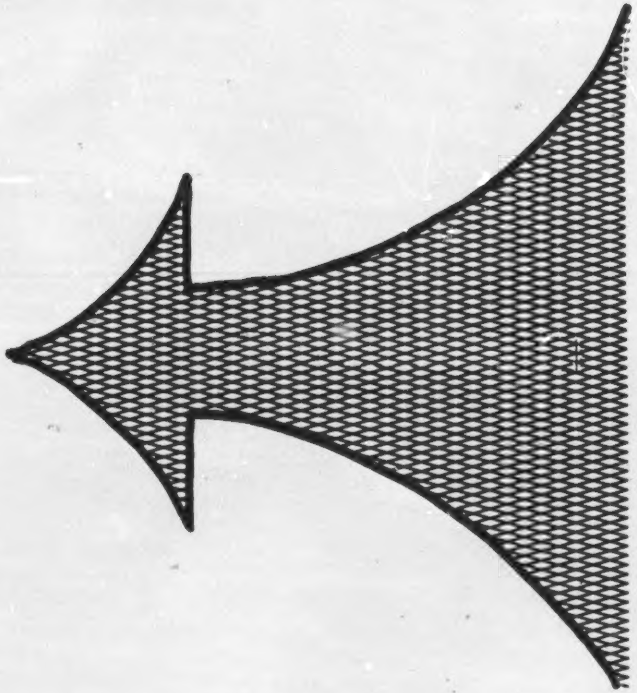
NO

Assign EM on PCS to student detachment of major command with duty station at school

YES

Assign EM on PCS to student detachment of school

Adams, 1968. pp. 4-8.



AFTER

84. Explosive Rounds in Hot Tubes

Explosive projectiles in heated tubes present an extremely hazardous situation. High rates of fire for extended period with high charges necessitate the following precautions be observed:

a. Do not chamber the round in a weapon until immediately prior to firing.

b. A round that has been chambered in a weapon should be fired or removed from the weapon within 5 minutes.

c. If the round in a heated tube cannot be fired or removed within the 5-minute period, the following actions should be taken:

(1) Where a misfire *is not* involved and in the event the round cannot be fired or removed within 5 minutes, the primer and propelling charge should be removed immediately, then elevate the cannon tube approximately 30° and evacuate all personnel to safe distance. Allow the projectile and weapon to cool for 2 hours.

(2) After a 2-hour waiting period proceed as follows. Move the weapon carefully or relocate to a remote position. If relocating is necessary the cannon tube should be lowered and locked in the traveling position. Waste will be placed in the chamber to cushion the projectile and to protect the face of the breechblock while the weapon is being moved. Request assistance from EOD personnel or request Direct Support Maintenance personnel with technical advice of EOD personnel regarding recognition of possible exuded explosive or other hazards to carefully remove the cannon tube (with stuck projectile) at a remote location away from buildings and occupied areas. The cannon tube containing the stuck projectile should then be released to EOD personnel.

(3) For separate loading ammunition involved in a misfire:

(*a*) Wait for 2 minutes from the last attempt to fire before removing the primer. If the primer has fired, personnel should be evacuated to a safe distance for a 2-hour waiting period without removing the propelling charge. After the 2-hour waiting period remove the propelling charge and follow the guidance outlined in (2) above.

(*b*) If the primer has not fired after the 2-minute waiting period a new primer will be tried or the faulty firing mechanism corrected. Then should the weapon not fire within a total elapsed time of 5 minutes, the propelling charge will be removed and personnel should be evacuated to a safe distance for a 2-hour waiting period. The guidance outlined in (2) above should then be followed.

EXAMPLE 2 - LOGIC TREE APPLIED TO WEAPON SAFETY PROCEDURES

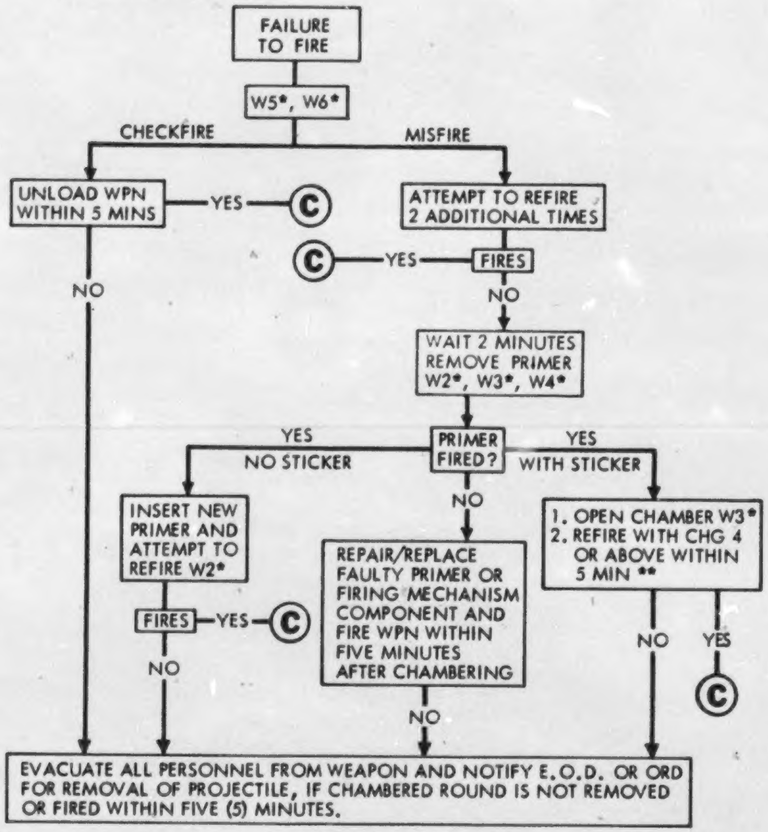
NARRATIVE METHOD

Decision points and instructions are buried in text. Difficult for user.

LOGIC TREE METHOD

Decision points, instructions, and warnings are clearly displayed for the user.

HOT TUBE MISFIRE PROCEDURES


FAILURE TO FIRE
W5*, W6*
CHECKFIRE
MISFIRE
UNLOAD WPN WITHIN 5 MINS
YES
C
NO
ATTEMPT TO REFIRE 2 ADDITIONAL TIMES
FIRES
YES
C
NO
WAIT 2 MINUTES REMOVE PRIMER W2*, W3*, W4*
PRIMER FIRED?
YES NO STICKER
YES WITH STICKER
NO
INSERT NEW PRIMER AND ATTEMPT TO REFIRE W2*
FIRES
YES
C
NO
REPAIR/REPLACE FAULTY PRIMER OR FIRING MECHANISM COMPONENT AND FIRE WPN WITHIN FIVE MINUTES AFTER CHAMBERING
NO
1. OPEN CHAMBER W3*
2. REFIRE WITH CHG 4 OR ABOVE WITHIN 5 MIN **
NO
YES
C
EVACUATE ALL PERSONNEL FROM WEAPON AND NOTIFY E.O.D. OR ORD FOR REMOVAL OF PROJECTILE, IF CHAMBERED ROUND IS NOT REMOVED OR FIRED WITHIN FIVE (5) MINUTES.

*WARNINGS:

1. USE CHG 1 IN COMBAT EMG ONLY
2. HANGFIRE
3. STAND CLEAR OF RECOILING PARTS
4. STICKER
5. COOK-OFF TIMES APPLY
6. 5 MINUTE TIME LIMIT W/HOT TUBES
7. 50 FOOT LANYARD USED

LEGEND: Ⓒ WEAPON CLEARED

**NOTE: NO LOSS OF RANGE IS EXPECTED AFTER A STICKER IS FIRED WITH NEW CHARGE

JOB PERFORMANCE AIDS

SAMPLE A: JOB AIDS APPLIED TO TROUBLESHOOTING AND MAINTENANCE OF AIRCRAFT EQUIPMENT

PURPOSE

Job aids developed for the Air Force for maintenance and troubleshooting tasks.

RESULTS OF USE

When job performance aids were tested by the Air Force they found:

Apprentices using job performance guides outperformed specialists using TOs as guides.

The troubleshooting aids resulted in a reduction of both performance time and maintenance errors.

The technicians had highly positive attitudes toward the job guides.

PRINCIPLES EMPLOYED IN THE DESIGN OF JOB PERFORMANCE AIDS

The number of separate but related steps to be presented in any task was specified.

A fixed syntax and preferred verb list was used to help overcome reading and interpretation problems.

EXAMPLES

PURPOSE OF JOB AID

Example 1 - Procedures for troubleshooting equipment	page 174
Example 2 - Procedures for maintenance of equipment	page 174

REFERENCES

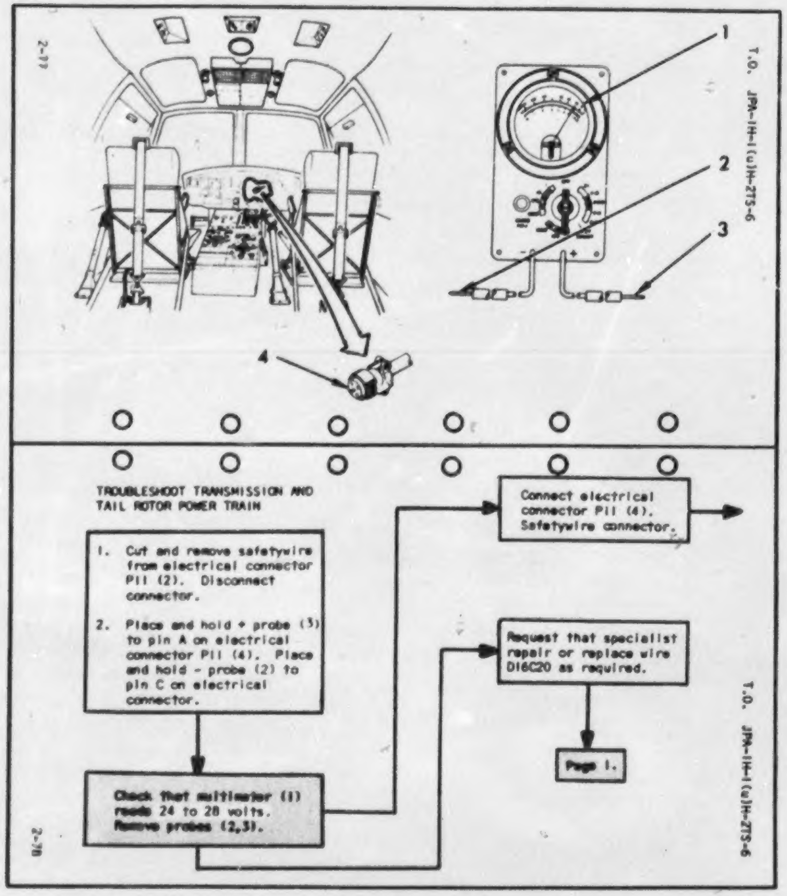
Project PIMO Final Report: Summary, Volume 1 (TR-69-155). Norton Air Force Base, California: Space and Missile Systems Organization, Air Force Systems Command. May 1969.

John D. Folley, Jr., et al. *Fully Proceduralized Job Performance Aids: Volume 1—Draft Specification For Organizational Maintenance (TR AFHRL-TR-71-53, Volume I).* Wright-Patterson Air Force Base, Ohio: Air Force Human Resources Laboratory, Air Force Systems Command. December 1971.

Andrew P. Chenzoff, et al. *Guidance and Specification for the Preparation of Fully Proceduralized Job Aids for Organizational and Intermediate Maintenance of Electronic Subsystems, (TR AFHRL-TR-71-23).* Brooks Air Force Base, Texas: Air Force Human Resources Laboratory, Air Force Systems Command. June 1971.

EXAMPLE 1

JOB AID FOR TROUBLESHOOTING



TROUBLESHOOT TRANSMISSION AND TAIL ROTOR POWER TRAIN

1. Cut and remove safetywire from electrical connector P11 (2). Disconnect connector.
2. Place and hold + probe (3) to pin A on electrical connector P11 (4). Place and hold - probe (2) to pin C on electrical connector.

Check that multimeter (1) reads 24 to 28 volts. Remove probes (2,3).

Connect electrical connector P11 (4). Safetywire connector.

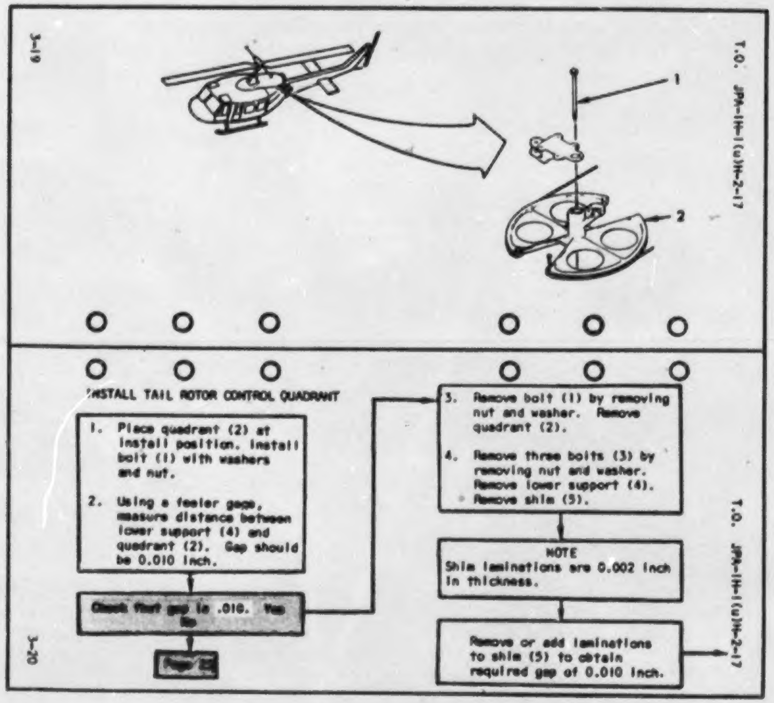
Request that specialist repair or replace wire D16C20 as required.

Page 1.

Folley, et al., 1971, p. 51.

EXAMPLE 2

JOB AID FOR MAINTENANCE



INSTALL TAIL ROTOR CONTROL QUADRANT

1. Place quadrant (2) at install position. Install bolt (1) with washers and nut.
2. Using a feeler gage, measure distance between lower support (4) and quadrant (2). Gap should be 0.010 inch.

Check that gap is .010. Yes No

Page [illegible]

3. Remove bolt (1) by removing nut and washer. Remove quadrant (2).
4. Remove three bolts (3) by removing nut and washer. Remove lower support (4). Remove shim (5).

NOTE
Shim laminations are 0.002 inch in thickness.

Remove or add laminations to shim (5) to obtain required gap of 0.010 inch.

Folley, et al., 1971, p. 28.

SAMPLE B: JOB AIDS FOR ELECTRONIC EQUIPMENT MAINTENANCE

PURPOSE

Job aids developed for the Army for electronic equipment malfunction and maintenance.

TYPES OF TASKS FOR WHICH JOB AIDS WERE CONSTRUCTED.

Maintenance tasks.

Troubleshooting tasks.

Removal and replacement tasks.

Final test and alignment tasks.

RESULTS

When Job Aid materials such as these have been tested it has been found:

Using this type of Job Aid, training time can be cut as much as 50%; and,

students perform as well or better than conventionally trained students.

EXAMPLE

The four job aids presented direct the user in the process of setting up the equipment to the final analysis of fault.

pages 176-177

REFERENCES

Gebhard, Richard M. *Development of a Training Program and Job Aids for Maintenance of Electronic Communication Equipment.* Alexandria, Virginia: Human Resources Research Organization. December 1970.

Shriver, Edgar L., Fink, C. Dennis, and Trexler, Robert C. *Implementation and Checkout of the FORECAST Concept of Electronic System Repair at the U.S. Army Ordnance Guided Missile School.* Alexandria, Virginia: Human Resources Research Organization. August 1963.

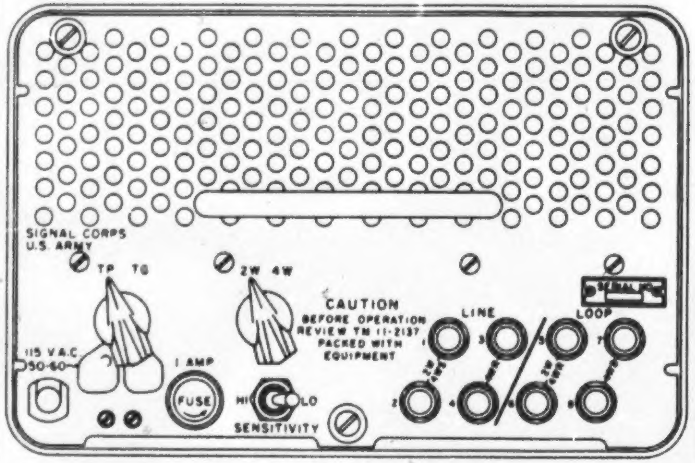
Shriver, Edgar L., Fink, C. Dennis, and Trexler, Robert C. *FORECAST Systems Analysis and Training Methods for Electronics Maintenance Training.* Alexandria, Virginia: Human Resources Research Organization. May 1964.

Shriver, Edgar L. and Trexler, Robert C. *A Description and Analytic Discussion of Ten New Concepts for Electronics Maintenance.* Alexandria, Virginia: Human Resources Research Organization. December 1966.

AFTER THE TELEGRAPH-TELEPHONE SIGNAL CONVERTER IS SET UP--

Preliminary Actions

1. Put the TP-TG switch in the TP position.
2. Put the 2W-4W switch in the 4W position.
3. Put the SENSITIVITY switch in the HI position.
4. Strap E1 to E3 and E2 to E4.
5. Connect the auxiliary power cord to E7 and E8.



Telegraph-Telephone Signal Converter 182/U, control panel.

START TROUBLESHOOTING WITH THE MAIN TESTS AND THEN GO AS DIRECTED

MAIN TESTS

Test	Procedure	Obtained Results	Next Test or Source of Trouble
M-1	Measure resistance across E7 and E8 with S1 in 4W, then across E5 and E6 with S1 in 2W.	Less than 1600 ohms, S1 in 4W.	Go to I-1A.
		Less than 1600 ohms, S1 in 2W.	Go to I-1B.
		More than 1600 ohms, S1 in 2W and 4W.	Go to M-2.
M-2	Plug in auxiliary power cord and TA-182/U power cord.	K1 clicks when auxiliary power cord is connected, other relays not click, tubes do not light.	Go to S-2A.
		Some tubes do not light.	Go to S-2B.
		K1 does not click when the auxiliary power cord is connected, other relays do not click when TA-182/U warms up, E10 does not ring, tubes light.	Go to I-2F.
		K1 clicks when the auxiliary power cord is connected, other relays do not click when the TA-182/U warms up, E10 does not ring, tubes light.	Go to I-2G.

SUB TESTS

Test	Procedure	Obtained Results	Next Test or Source of Trouble
S-2A	Unplug the power cord and check the fuse. If the fuse is not blown go to I-2A, if it is blown replace and remove V7 and V8. Plug power cord back into the AC source and replace V7 and V8 one at a time.	Fuse blows with V7 and V8 removed.	Go to I-2B.
		Fuse blows when V7 is replaced.	Go to I-2C.
		Fuse blows when V8 is replaced.	Go to I-2D.
		Fuse doesn't blow when V7 and V8 are replaced.	Return to M-2.
S-2B	Replace tubes that are not lighted.	Tube lights.	Return to M-2.
		Tube does not light.	Go to I-2E.
S-2C	Put headset (TS-190) across E1 and E2.	Tone is heard.	Go to M-3.
		Tone is not heard.	Go to I-2H.
S-4A	Apply 1600 cps at +10 dbm to B5 and ground.	E10 does not ring.	Go to L-4A.
		E10 rings.	Go to I-4D.
S-4B	While E10 rings with 1600 cps or 1225 cps apply a short across E5 and E6.	E9 does not light.	Go to I-4G.
		E9 lights.	Go to M-5.

ISOLATION INFORMATION

I-1A

IF:

K1, short.
Wiring from S1 contacts to E7 and E8 to K1 to E1 and E2, shorted.

THEN:

The resistance will be less than 1600 ohms across E7 and E8.

I-1B

IF:

K1 contacts 12 to 4 and 11 to 2, open.

THEN:

The resistance will be less than 1600 ohms across E5 and E6.

I-2A

IF:

Winding 8-9, 1-2 of T6, open.
Power cord, open.
Power plug, open.
Fuse holder, open.

THEN:

Tubes will not light nor will relays K2 or K3 click.

I-2B

IF:

Any windings (5-7, 3-4, 8-9, 1-2) of T6, shorted.
Filament circuit, shorted.

THEN:

Fuse F1 will blow.

Appendix A

THE FORCAST READING DIFFICULTY LEVEL FORMULA

The FORCAST* Reading Difficulty Level Formula should be used as a quality control check on your writing. It will help you to keep your writing at the level of the person who will be reading the manual.

The reading difficulty level should be checked frequently during the time you are writing the manual. Don't wait until you have the draft copy completed; check while you are writing.

An important thing to remember when using the FORCAST formula for a quality control check is to *not* write *to* the formula. Your writing should be directed to the user of the manual, not the formula. The formula serves as a guide for the reading difficulty level of material you *have* written and not the material you are getting ready to write.

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*This formula was named the FORCAST (*FOR*d, *CA*ylor, *ST*icht) formula, following the usual practice in readability research.

SPECIAL INSTRUCTIONS

1) Select the 150 word passage from connected discourse. Do not use this formula to check unconnected statements. It's best to start counting words at the beginning of a paragraph or section.

2) Counting the Words

Words include numbers, letters, symbols, and groups of letters that are surrounded by white spaces. Hyphenated words and contractions are counted as one word. As an example, each of the following is counted as one word: "couldn't", "F.O.B.", "i.e.", "$32,008", "second-grade".

3) Counting the Syllables

Count syllables the way the word is pronounced: such as "row" has one syllable, "mention" has two. With symbols and figures the syllables are known by the way they are normally read aloud, such as, one syllable for ("cents"), three for R.F.D. ("are-eff-dee"), and four for 1918 ("nineteen eighteen"). When in doubt about syllables, consult a dictionary.

USING THE FORCAST READING DIFFICULTY LEVEL FORMULA

STEP 1

Count the number of one syllable words in a **150** -word passage.

Number of one syllable words = **79**

(Bracketed) Words Are One Syllable Words

Adequate protection [from] [the] elements [and] environmental conditons [must] [be] provided [by] [means] [of] proper storage facilities, preservation, packaging, packing, [or] [a] combination [of] any [or] [all] [of] [these] measures. [To] adquately protect [most] items [from] [the] damaging effects [of] water [or] water-vapors, adequate preservation [must] [be] provided. [This] [is] often [true] even [though] [the] item [is] [to] [be] [stored] [in] [a] warehouse provided [with] mechanical [means] [of] controlling [the] temperature [and] humidity. Several methods [by] [which] humidity [is] controlled [are] [in] [use] [by] [the] culinary services. [Use] [is] also [made] [of] mechanically ventilating [and] dehumidifying selected sections [of] existing warehouses. Appropriate consideration [will] [be] given [to] [the] preparation [and] [care] [of] items [stored] under specific [types] [of] storage [such] [as] controlled humidity, refrigerated, [and] heated. [The] amount [and] levels [of] preservation, packaging, [and] packing [will] [be] governed [by] [the] specific method [of] storage [plus] [the] anticipated [length] [of] storage.

STEP 2

Divide the number of one syllable words by **10**

$$10\,\overline{)\,79} = 7.9$$

STEP 3

Subtract the result from **20** to obtain the reading grade level.

$$\begin{array}{r} 20.0 \\ -7.9 \\ \hline 12.1 \end{array}$$

Reading Grade Level

12.1

Appendix B

THE ARMY WRITER'S REFERENCE SHELF

This appendix lists the many reference aids available to Army writers. The reference sources have been classified into the nine categories shown in the "contents" block.

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I. MILITARY PUBLICATION INDEXES

1. DA Pam 310-1	Index of administrative Publications (Regulations, Circulars, Pamphlets, Posters, General Orders, Joint Chief of Staff Publications, and DoD Publications).
2. DA Pam 310-2	Index of Blank Forms
3. DA Pam 310-3	Index of Doctrinal, Training, and Organizational Publications (Field Manuals, Reserve Officer Training Corp Manuals, Training Circulars, Army Training Programs, Army Subject Schedules, Army Training Tests, Firing Tables and Trajectory Charts, Tables of Organization and Equipment, Type Tables of Distribution, and Tables of Allowances).
4. DA Pam 310-4	Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
5. DA Pam 310-6	Military Publications. Index of Supply Catalogs and Supply Manuals (excluding Types 7, 8, and 9).
(Specialized Indexes)	
6. DA Pam 108-1	Index of Army Motion Pictures and Related Audio-Visual Aids.
7. DA Pam 310-7	Military Publications: U.S. Army Index of Equipment Modification Work Orders.
8. DA Pam 310-8	Index of Army Personnel Tests and Measures.
9. DA Pam (C)310-9	Index of Communications Security (COMSEC) Publications (U).
10. DA Pam 310-12	Index and Description of Army Training Devices.
11. DA Pam 310-14	Index of Depot Maintenance Work Requirements.
12. DA Pam 310-35	Index of International Standardization Agreements.
13. TRADOC Pam 310-3	TRADOC Army-Wide Training Literature.

II. MOS STRUCTURE AND PROPONENT AGENCY

1. AR 611-101	Manual of Commissioned Officer Military Occupational Specialties.
2. AR 611-112	Manual of Warrant Officer Military Occupational Specialties.
3. AR 611-201	Enlisted Military Occupational Specialties.
4. TRADOC Reg 351-5	Designation of MOS/ASI Responsibility.

III. IDENTIFICATION OF UNIT PERSONNEL AND EQUIPMENT

1. “Duty Position in TOE, MOS Sequence OPO 99”	(Note: provides information for relating an MOS to each applicable TOE.)
2. TRADOC Pam 310-4	Reference Digest of Tables of Organization and Equipment (TOE). (ATCD-OE)
3. See specific TOE and TDA listings in DA Pam 310-3.	

IV. INDIVIDUAL AND UNIT TRAINING (CONTENT, TRAINING OBJECTIVES, PERFORMANCE STANDARDS)

1. See DA Pam 310-3 or TRADOC Pam 310-3 for listings of specific Army Subject Schedules, Army Training Programs, and Army Training Tests.
2. See DA Pam 350-10, U.S. Army Formal Schools Catalog.

V. ADVANCE NOTICE OF NEW AND OBSOLETE PUBLICATIONS (DISTRIBUTED WEEKLY)

1. See US Publications Center Bulletin notice in DA Pam 310-3, Sect. I.
2. Consolidated Equipment Publications Schedule, CG, US Army Materiel Command (provided forecasted publication dates of new and revised equipment publications).

VI. SCIENTIFIC AND TECHNICAL LIBRARY RESOURCES

1. DA Pam 70-1	User's Guide to Technical Library Services.
2. DA Pam 70-2	Holdings and Services: Scientific and Technical Information.

VII. WRITING AND LITERATURE PRODUCTION GUIDELINES

1. AR 310-1	Publications, Blank Forms, and Printing Management.
2. AR 310-2	Identification and Distribution of DA Publications and Issue of Agency and Command Administrative Publications.
3. AR 310-3	Preparation, Coordination, and Approval of Department of the Army Publications, with TRADOC Supplement 1.
4. AR 310-25	Dictionary of United States Army Terms (Short Title: AD).
5. AR 310-50	Authorized Abbreviations and Brevity Codes.
6. TRADOC Reg 310-1	Preparation of Unit Training Publications (ATP, ATT, Non-MOS ASubjScd).
7. SB 700-20	Army Adopted and Other Items of Materiel Selected for Authorization. (Note: contains generic nomenclature to be used to describe items of supply or equipment in place of specific model or stock numbers whenever possible.)

VIII. SYSTEMS ENGINEERING OF TRAINING

1. CON Reg 350-100-1	Systems Engineering of Training (Course Design).
2. CON Pam 350-11	Systems Engineering of Unit Training (ATP, ATT, Non-MOS ASubjScd).

IX. BOOKS ON WRITING

THE FOLLOWING LIST INCLUDES ONLY A FEW OF THE MANY BOOKS ON WRITING.
THEY GIVE YOU A SAMPLE OF THE RANGE OF MATERIAL AVAILABLE.

Basic References.

1. DA Pamphlet 1-10 (Jan. 1959) *Improving Your Writing.*

   Helpful pamphlet briefly discussing stages of writing, suggestions for effective writing, and writing formulas and yardsticks.

2. Perrin, Porter G. *Writer's Guide and Index to English.* Rev. ed. Chicago: Scott, Foresman and Company, 1950.

   A handbook of grammar, style, and composition.

General Writing

3. Flesch, Rudolf. *The Art of Readable Writing.* New York: Harper & Brothers Publishers, 1949.

   Describes aspects of clear writing. Contains a "Reading Ease Score" based on words per sentence and syllables per 100 words.

4. Gunning, Robert. *The Technique of Clear Writing.* Rev. ed. New York: McGraw-Hill Book Company, 1968.

   Presents a Fog Index to measure, readability. Lists and describes at length ten principles of clear writing. Describes "fog" in several types of writing.

5. Strunk, William, Jr. Revised by White, E.B. *The Elements of Style.* New York: The Macmillan Company, 1959.

   Clear and concise statement of elementary principles of usage, composition, and style.

Technical Writing

6. Blicq, R.S. *Technically - Write! Communication for the Technical Man.* Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1972.

   Presents examples of various types of technical writing and illustrations plus a chapter on techniques of writing and one on mechanics of writing.

7. Coleman, Peter and Brambleby, Ken. *The Technologist as Writer: An Introduction to Technical Writing.* Ryerson Press, 1969 (distributed by McGraw-Hill Book Co.).

   Strong emphasis on types of writing and orderly development of information.

8. Hoover, Hardy. *Essentials for the Technical Writer.* New York: John Wiley & Sons, Inc., 1970.

   Treats both effective writing (inc. organizing thoughts) and specifics of writing reports and specifications. Has several checklists. Has examples and exercises covering sentence and paragraph structure, including corrections and analysis of each exercise.

9. Marder, Daniel. *The Craft of Technical Writing.* New York: The Macmillan Company, 1960.

   Treats effective writing and organization of material. Main divisions include techniques of organization, structure as a whole (techniques for beginning, developing, and ending), and techniques of style.

10. Morris, Jackson E. *Principles of Scientific and Technical Writing.* McGraw-Hill Book Company, 1966.

    Predominantly treats effective writing and organization. Also treats some specific types of technical writing.

11. Sherman, Theodore A. *Modern Technical Writing.* 2nd ed. Englewood Cliffs, N.J.: Prentice-Hall, Inc. 1966.

    Treats both effective writing and organization and also details of specific types of writing. Has exercises at the end of each chapter.

12. Zall, Paul M. *Elements of Technical Report Writing.* New York: Harper & Brothers, Publishers, 1962.

    Presents and discusses various stages of report writing: planning, collecting information, designing (organizing), rough drafting, and revising. Presents several checklists for revision and some basic rules of grammar. Geared toward effective writing rather than production specifics.

Appendix **C**

ANSWER KEYS: ESTIMATING THE READING GAP BETWEEN YOU AND YOUR USER

ANSWERS TO EXERCISE I, CHAPTER 4:

HOW LARGE IS THE "READING SKILL" GAP BETWEEN YOU AND YOUR USER?

Use the table on the left side of the test booklet to answer the questions below. Write your answer on the blank space as directed in the question.

Are there any questions? You have ____ minutes. Please answer all the questions.

1. To properly inspect the voicemitter-outlet valve assembly, which of the following should be checked? (Place an "X" in front of the items to be checked.)

X Crimping ring
____ Missing temple pins
____ Distortion
X Valve disk
____ Inlet valve caps
X Movement of drinking mouthpiece
____ Rust

2. Place the following items in the correct sequence for inspection. Put a "1" in front of the item to be inspected first; a "2" in front of the second item; and so on.

4 Check for loss of elasticity in head harness
6 Visually inspect filter elements
1 Inspect for missing temple pins
3 Inspect for discolored lenses
5 Check movement of drinking mouthpiece
2 Inspect for distortion of nosecup

3. What is the interval for operator preventive maintenance during peace time conditions?

6 months

ANSWERS TO EXERCISE 2, CHAPTER 4:

HOW LARGE IS THE "LANGUAGE SKILL" GAP BETWEEN YOU AND YOUR USER?

Reading/Language Test

$\underset{1}{\underline{\text{The}}}$ purpose of padding a $\underset{2}{\underline{\text{cast}}}$ is to provide more $\underset{3}{\underline{\text{comfort}}}$ for the patient, to $\underset{4}{\underline{\text{lessen}}}$ the possibility of pressure $\underset{5}{\underline{\text{sores,}}}$ and to make it $\underset{6}{\underline{\text{easier}}}$ and safer to remove $\underset{7}{\underline{\text{the}}}$ cast.

Stockinet may be $\underset{8}{\underline{\text{used}}}$ next to the skin $\underset{9}{\underline{\text{as}}}$ a padding material for $\underset{10}{\underline{\text{a}}}$ close-fitting and well-$\underset{11}{\underline{\text{contoured}}}$ cast. It should not $\underset{12}{\underline{\text{be}}}$ used alone for acute $\underset{13}{\underline{\text{fractures}}}$, where there is excessive $\underset{14}{\underline{\text{swelling}}}$, or immediately after an $\underset{15}{\underline{\text{operation}}}$, since it tends to $\underset{16}{\underline{\text{constrict}}}$ and may impair circulation. $\underset{17}{\underline{\text{If}}}$ stockinet is used without $\underset{18}{\underline{\text{additional}}}$ padding, the fact should $\underset{19}{\underline{\text{be}}}$ noted with indelible pencil $\underset{20}{\underline{\text{on}}}$ the cast, so that $\underset{21}{\underline{\text{when}}}$ the cast is removed $\underset{22}{\underline{\text{the}}}$ electric cutter will be $\underset{23}{\underline{\text{used}}}$ with caution.

Sheet cotton $\underset{24}{\underline{\text{or}}}$ webril bandage can be $\underset{25}{\underline{\text{wrapped}}}$ over the stockinet in $\underset{26}{\underline{\text{one}}}$ to three layers. It $\underset{27}{\underline{\text{should}}}$ be roled on smoothly $\underset{28}{\underline{\text{with}}}$ the turns overlapping about $\underset{29}{\underline{\text{one-half}}}$ the width of the $\underset{30}{\underline{\text{bandage.}}}$

Bony prominences are then padded with pieces of felt.